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DISSERTATION

APPLYING AJZEN'S THEORY OF PLANNED BEHAVIOR IN EXAMINING RECYCLING BEHAVIOR IN GREECE

of

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DEDICATIONS

...dedicated to my loving parents and to all who made this possible

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Abstract

The aim of this study is to explore and examine recycling behavior in Greece. As one of the three pillars of sustainability along with economy and society, environment has increasingly become the center of attention due to its continuous deterioration. Thus, examining the factors that influence pro-environmental behavior, as expressed by consciously recycling generated waste, will prove to be crucial in understanding and encouraging such behaviors. This thesis sets to explore the mechanism behind the formation of recycling intentions, drawing from Ajzen's *Theory of Planned Behavior* (TPB).

According to Ajzen's theory, the influencing parameters of behavioral intention, and ultimately of the actual behavior, are the attitude toward the behavior, subjective norm and perceived behavioral control. The theory is furthermore enriched by testing two additional variables, that of *moral norms* and *anticipated feelings of moral regret*. The importance of this study lays on the addition of these extra parameters and on the fact that it provides a useful insight in the recycling behavior concerning the "blue bin" recycling scheme in Greece.

The outcomes of the survey showed that the most significant predictor of recycling intentions, in the classical TPB model, is by far perceived behavioral control, followed by attitude and subjective norm. In the morally extended TPB though, significant predictors proved to be only perceived behavior control, which again exerted the stronger effect, followed by moral norms and subjective norm. The implications of these findings are discussed in the last part of the thesis.

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ABBREVIATIONS

ATT: Attitude

(C.A.M.S. – RECYCLING): Collective Alternative Management System – "RECYCLING"

CUGM: Central Union of Greek Municipalities

EU: European Union

HERRCO: Hellenic Recovery Recycling Corporation

KEPED: Centre for Alternative Environmental Management Inc.

MN: Moral Norms

MR: Moral Regrets

NAM: Norm Activation Model

PBC: Perceived Behavioral Control

SN: Subjective Norm

TPB: Theory of Planned Behavior

TRA: Theory of Reasoned Action

VBN: Value-Belief Norm

1. Introduction

1.1 An era of waste

"A society in which consumption has to be artificially stimulated in order to keep production going is a society founded on trash and waste, and such a society is a house built on sand."

Dorothy L. Sayers (1893–1957), British author

Creed or Chaos (1947)

Consumption and waste are two sides of the same coin- both are indicators of a nation's prosperity, and neither can exist alone. Indeed, in the modern society it is practically impossible to consume without generating waste. And this waste keeps on pilling up in the landfills, the oldest and most popular method of waste disposal, and currently the least desirable. Lavish lifestyles combined with an exponential population growth lead to even more consumption which leads to more and more waste. On top of that, more consumption means more resources are used in the production process. This vicious circle, that bleeds nature out of its valuable resources while at the same time burdens its surface with mountains of trash, is one gloomy legacy of our civilization to future generations. In a finite planet though, the era of affluence was bound to come to an inglorious end.

The need for waste reduction is becoming more and more pressing both for issues of human health and environmental protection (global warming, land contamination, water pollution etc.). According to European Commission (2010) each of the 500 million European citizens throws on average around half a ton of household waste every year. If we do the calculations, while adding the already huge amounts of waste generated from production activities (1355 million tons), we find that EU has a "waste production capacity" of 3 billion tons every year. With such huge quantities the increasing public awareness that waste management has gained comes as no surprise, being also on the top four priorities identified in EU's *Sixth Environment Action Programme, EAP* (2002-2012) (European Commission, 2002). The "waste problem" demands a solution on a local, national and international level. This solution can not only come from technological advances but, since it is a human behavior problem (Chan, 1998), a new mentality and culture of conservation and preservation has to prevail in order to fix it.

Reduce, reuse and recycle are known as the 3 Rs of waste management. From a hierarchical point of view reducing consumption is preferable to reusing materials, and reusing is preferable to recycling, where "*recycling means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes*" (European Commission, Arti.3-4, 2008). Despite this taxonomy regarding to the respective contribution to waste minimization, recycling has received the most support and promotion "…*because it can not only reduce the waste, but also turn materials into valuable resources*" (Chen and Tung, 2010, p.825).

The benefits of recycling are undisputable and no one will doubt its importance, yet few people, at least in Greece, demonstrate this concern in their private behavior. Only a 17% of the municipal solid waste is recycled in Greece (Eurostat, 2011). This is a very low percentage compared to that of Germany that recycles almost half of its municipal solid waste (48%) or Belgium, Sweden Slovenia, Denmark, Ireland and the Netherlands (32%-36%) (Eurostat, 2011). For Greece this low percentage is not expected to change in a time of severe economic crisis. The European Commission's survey on main concerns of European citizens (Standard Eurobarometer 79, 2013) revealed that a remarkably low percentage of Greeks (0%) identifies environment, climate and energy issues as an important issue facing Greece, with unemployment scoring 65%.

Nevertheless, the question still remains. Why that is, that the favorable attitude towards recycling cannot always be translated into actual recycling? And what ultimately drives people to recycle? This thesis will try to answer this question by focusing on the step before the actual behavior: the formation of recycling intentions. Drawing from the *Theory of Planned Behavior* the author seeks to understand what are the driving forces and motivational factors behind recycling and how the mechanism, that leads to the development of recycling intentions, works.

1.2 Contribution of the thesis

This thesis sets to explore the mechanism behind the formation of recycling intentions. From the marketing to the health sector, Ajzen's *Theory of Planned Behavior* has been widely used (Armitage and Conner, 2001) , providing satisfactory results and a strong predictive utility, and thus it will provide the model for this study, in order to enhance our understanding and prediction ability of the mechanism leading to the formation of recycling intentions.

The present study will add on other research that apply Ajzen's *Theory of Planned Behavior* for studying recycling, by enhancing the model and testing the validity of two additional research parameters, that of *moral norms* and *anticipated feelings of moral regret*. Furthermore it will provide a useful insight into the context of recycling intention and behavior of individuals in Greece.

1.3 Thesis Outline

In the next part of the thesis, namely the Literature Review, key concepts such as Recycling Behavior and its influential factors are analyzed. A detailed analysis of The Theory of Planned Behavior by *Icek Ajzen*, Professor of Psychology in the *University Of Massachusetts At Amherst*, follows in order to set the scene and the conceptual framework for the research part of the thesis. In the third part of the thesis the Methodology is outlined while the Results are presented in the fourth part. The thesis concludes offering a number of suggestions stemming from the relevant literature and the research results. Moreover, implications for policy development are reviewed and discussed along with limitations and suggestions for future research.

2. Literature Review

2.1 The case for recycling in Greece

"The case for recycling is strong. The bottom line is clear. Recycling requires a trivial amount of our time. Recycling saves money and reduces pollution. Recycling creates more jobs than landfilling or incineration. And a largely ignored but very important consideration, recycling reduces our need to dump our garbage in someone else's backyard."

David Morris (Institute for Local Self-Reliance, 1996)

As a member state of EU, Greece is obliged to re-use and recycle household (municipal) waste, such as at least paper, metal, plastic and glass, to a minimum of overall 50 % by weight by year 2020. Thus Greece would, comply with the objectives of the *Directive 2008/98/EC* on waste, that aims at making EU a recycling society with a high level of resource efficiency (European Commission, 2008).

These mandatory recycling targets present a serious challenge to Greek waste management authorities who have to deal with 4.8 million tons of municipal solid waste each and every year (Ministry of Environment, 2009). It is indeed of a great importance for policy makers to identify, develop, implement and control the necessary actions for

Greece to reach these targets. Greece is among the member states producing the least average waste per person but on the other hand has one of the highest rates (82%) of this waste landfilled, and only 17% recycled (see *Table 2.1.1*, Eurostat, 2011). Achieving the aforementioned targets means that Greece has to substantially increase its recovery rate of recyclable materials through a reliable recycling system. This can only be done by thoroughly understanding the drivers of recycling intentions and ultimately behavior, in order to design successful interventions and recycling schemes.

Municipal waste, 2009

	Municipal waste generated, kg per person	Total municipal waste treated, kg per person	Municipal waste treated, %			
			Landfilled	Incinerated	Recycled	Composted
EU27	**513**	**504**	**38**	**20**	**24**	**18**
Belgium	491	486	5	35	36	24
Bulgaria	468	450	100	-	-	-
Czech Republic	316	274	83	12	2	2
Denmark	833	833	4	48	34	14
Germany	587	564	0	34	48	18
Estonia	346	285	75	0	14	11
Ireland	742	730	62	3	32	4
Greece	478	474	82	-	17	2
Spain	547	547	52	9	15	24
France	536	536	32	34	18	16
Italy	541	594	45	12	11	32
Cyprus	778	778	86	-	14	-
Latvia	333	333	92	0	7	0
Lithuania	360	342	95	-	3	1
Luxembourg	707	707	17	36	27	20
Hungary	430	427	75	10	13	2
Malta	647	643	96	-	4	-
Netherlands	616	520	1	39	32	28
Austria	591	591	1	29	30	40
Poland	316	264	78	1	14	7
Portugal	488	488	62	19	8	12
Romania	396	308	99	-	1	0
Slovenia	449	495	62	1	34	2
Slovakia	339	311	82	10	2	6
Finland	481	481	46	18	24	12
Sweden	485	480	1	49	36	14
United Kingdom	529	538	48	11	26	14
Iceland	554	520	73	11	14	2
Norway	473	467	14	42	28	16
Switzerland	706	706	-	49	34	17

Data for the EU27, Denmark, Germany, Spain, France, Italy, Cyprus, Luxembourg, Netherlands, Romania, Portugal and the United Kingdom are estimated.
0 equals less than 0.5%, "-" indicates a real zero

Table 2.1.1: Municipal Solid Waste 2009 (Eurostat, 2011)

The available infrastructure in Greece is known as the "blue recycling bin system" that is a cooperation between the *Central Union of Greek Municipalities* (CUGM) and the

Hellenic Recovery Recycling Corporation (HERRCO) (a corporation founded in 2001 by companies that produce packaging materials or trade packaged goods). This cooperative scheme was ratified by the Ministerial Decisions *No. 106453/20-02-2003* and No. *118019/18-3-09*, the latter extending the contract up to 2015 (HERRCO, 2013). It should be noted that there exist also a number of other recycling programs such as the Collective Alternative Management of Oils' Packaging "*Centre for Alternative Environmental Management Inc.*" under the name KEPED SA, the Reciprocal Collective Alternative Management of Packaging "*Reciprocal Recycling*" and the Individual system for alternative management of packaging under the private label of *AB Vassilopoulos SA* (Ministry of Environment, 2009).

In this thesis we will only focus on the blue recycling bins' collection system. This is because the blue bin scheme is the most known (EOAN, 2013) and easily accessible recycling system for Greeks who can make use of it in order to dispose household waste and recyclable waste at other premises as well (work, institutions, parks etc.).

Figure 2.1.1: The blue recycling bin

In the blue recycling bins program under the name *Collective Alternative Management System* – "RECYCLING" (C.A.M.S. – RECYCLING), individuals can recycle aluminium, tinplate, plastic, glass and paper. The 241 (out of the total 325) municipalities involved undertake the responsibility for collection after receiving some support in equipment and lately in cash by HERRCO that is also responsible for properly treating the collected materials (Ioannou *et al*., 2010). The system of blue recycling bins services 82%

of the total Greek population (data from 2012) through 138.000 blue bins (120.000 active bins so far) (see *Table 2.1.2*). The available data show that the amount of collected packaging waste, through the blue bins, was approximately 416.000 metric tons for the year 2008 (Ioannou *et al.*, 2010). This amount refers only to the cooperative municipalities which do not involve municipalities of big cities such as Kavala, Xanthi and Drama, or major touristic destinations such as Rhodes, a major drawback of the scheme (HERRCO, 2013).

Table 2.1.2: Collective Alternative Management System – "RECYCLING" (C.A.M.S. – RECYCLING) (*HERRCO, 2013)*

Index	*2009*	*2010*	*2011*	*2012*
Inhabitants served (cumulative sums, mil.)(1)	7.6	8.1	8.1	8.9
Percentage of population covered (%)	74%	79%	79%	82%
RSCs (cumulative sums)	22	28	27	28
Bins delivered (cumulative sums, thousands)(2)	98	111	126	138
Collection Vehicles delivered (cumulative sums, thousands)	327	359	370	387
Recycling Bags distributed (cumulative sums, mil.)	2.0	2.3	2.6	2.8

(1) It includes collaborating Local Authorities or bodies for the handling of municipal waste. The population of 2012 is according to the 2011 census by the National Statistical Service of Greece (while the population figures of 2009-2011 are based on the 2011 census by the National Statistical Service of Greece).

(2) The ongoing recording of bins shows that the existing network currently possesses approx. 120.000 active blue bins.

2.2 Recycling behavior

If we would like to change people's behavior we need to understand what determines their actions and decisions. (Klockner, 2013)

To recycle or not to recycle, that is the question. Recycling decision is a complex decision since many factors have to be taken into account (e.g. Davies *et al.*, 2002; Barr *et al.*, 2003; Tonglet *et al.*, 2004). Factors such as the convenience of the available recycling infrastructure, related recycling programs, awareness of the consequences of recycling, environmental knowledge and concern, type and area of residence, perceived social pressure, legislation, attitudes towards recycling, promotional campaigns etc. The use of socio-demographic indicators such as age, gender, educational and social background as variables for predicting recycling behavior may be appealing but nevertheless has been shown to be problematic since numerous studies have attempted to establish the profiler of recycler without though reaching a consensus (Davies *et al.*, 2002).

Two important issues that should be kept in mind is the purely voluntary nature of recycling in Greece, meaning that Greeks have no legal obligation whatsoever to use the "blue bins", as well as that there is no economic benefit (e.g. a premium paid) for using them. Thusly, recycling does not lead to an immediate tangible reward or punishment for the recycler (Chan, 1998; Chan and Bishop, 2013). This is a crucial issue in the recycling domain and will be further discussed on a following section.

Moreover, recycling is a low involvement decision with a repetitive character affected by habits and inertia (Davies et al., 2002) and is "*often relatively inexpensive but, nevertheless, play[s] a significant role in conservation.*" (Boldero, 1995, p.440).

These characteristics make recycling a separate unique category within the conservation domain, although this does not mean that recycling itself is a homogeneous behavior set (Boldero, 1995). Recycling different materials may entail different cognitive procedures and be subject to different determinants. This may reflect a perceived additional difficulty or inconvenience (or the exact opposite) in recycling a specific material (e.g. glass, paper etc.) or consumer choices in product purchase (paper vs plastic packaging). Whatever the reason behind this, the variations in the recycling rates of materials confirm Boldero's (1995, p.443) observation. Indeed, the recycling rates of different materials vary significantly, for example in Attica, an area in Greece, as shown in *Figure 2.2.1* (for more detailed data see Anthouli *et al*., 2013).

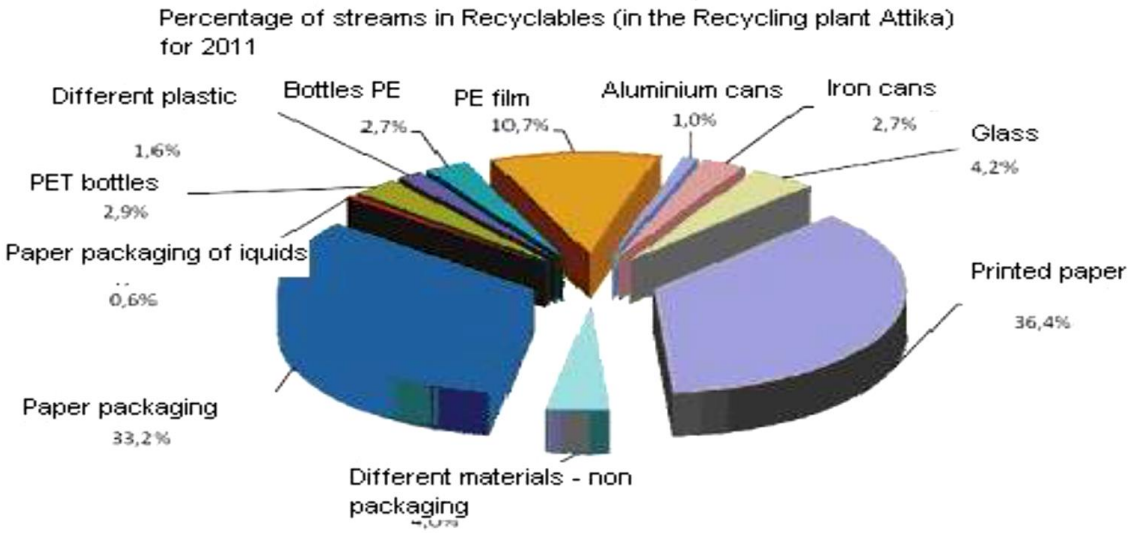


Figure 2.2.1: Composition of Recovered Materials of the Attica Recycling Plant (Anthouli et al., 2013)

The above should have made clear the complex nature of recycling behavior. Many studies have tried to investigate recycling behavior with mixed results and inconclusive inferences (see "*A moral extension of TPB"* section 2.4). This is not surprising if we also think that recycling behavior implies that an individual is conflicted between his/her immediate self-interest, which would be not to engage in a probably inconvenient situation, and the interest of the society in general, a true "tragedy of the commons" (Kaiser, 2006). In this conflict it is unsure what the individual would end up endorsing, for how long and why.

If policy makers want to encourage or facilitate recycling behavior they have to understand what drives recycling, what is the process of the formation of recycling intentions and what are the entry points of successful interventions. Individual behavior can have an impact and truly contribute in solving our waste management crisis and that is why it is important to understand how to "gauge" it. We need first to understand why some people recycle and why others do not before we attempt to change the latter.

We can conceptualize recycling as a goal-directed behavior, as most human behaviors are (Ajzen, 1985, p.11). Once the goal is set, a plan is formulated in order to achieve this goal. This plan entails a number of actions, some more routine than others, controlled by the *intention to recycle*. It is the intention to perform, or not, a behavior that immediately determines that action (Ajzen, 1985, p.12). In other words intentions to recycle can predict with a high degree of accuracy the behavior of recycling itself. Having stated that, the next step in order to understand recycling behavior is to identify and examine the determinants of intentions.

The relevant literature identifies the following determinants that define and shape intentions to recycle and ultimately recycling behavior: values (general attitudes towards the environment), situational factors (access to resources, socio-demographic factors, knowledge) and psychological factors (personality factors, intrinsic motivation, subjective norms to act, attitude and more) (Boldero, 1995; Barr *et al*., 2003; Bezzina and Dimech, 2011).

As set forth above, this study focuses on how recycling intentions are formed. It is very important to distinguish between intentions and actual behavior. An individual may as well intend to recycle but never actually recycle. As Davies et al. (2002, p.98) acutely noted: "*…in the context of recycling behavior intention is an expression of support for the*

behavior and not a commitment to act, therefore it is not predictive of the behavior being measured". This discrepancy that policy makers should be aware of, is often called a "value-action gap" (Barr et al., 2003) or "attitude-behavior gap" in the models that intention mediates the link between attitudes and behavior (Davies et al., 2002).

Therefore, it is extremely important to form a conceptual framework in order to successfully investigate the antecedents of the highly complex recycling behavior. The studies investigating the antecedents of pro-environmental behaviors in general have relied on theoretical models grounded in a combination of attitudes, values, and norms (Cordano et al., 2010) and so will the present thesis. The next section will introduce the theory which encompasses all the aforementioned factors in a comprehensive framework.

2.3 The Theory of Planned Behavior

"…explaining human behavior in all its complexity is a difficult task"

Icek Ajzen (1991, p.179)

The *Theory of Planned Behavior* (henceforth TPB) (Ajzen, 1985, 1991; Ajzen and Madden, 1986) is an extension to the initial *Theory of Reasoned Action* (henceforth TRA) by Fishbein & Ajzen (1975) stemming from the Social Psychology field. TPB is an expectancy-value model of attitude-behavior relationships (Conner and Armitage, 1998) that can be described as a deliberative processing model since it assumes that individuals make behavioral decisions based on careful consideration of available information (Conner and Armitage, 1998).

Both in TRA and TPB we find the role of ***intention*** to be central as Ajzen (1991, p.181) defines it "…*the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior*". Intention is a determination to act in a certain way which means that when a person performs a volitional behavior then this behavior is under the control of intention. The link between intentions and behavior reflects the fact that people tend to engage in behaviors they intend to perform (Conner and Armitage, 1998, p.1431). In other words people have a high degree of volitional control in their decision process which leads them to make *reasoned* choices among alternatives, meaning that there is an element of conscious *reasoning* involved in the mechanism leading to intention formation.

But what forms behavioral intention? For TRA behavioral intention is a function of two factors, *attitude (ATT)* toward the behavior in question and *subjective norm (SN)*. Attitudes are the overall evaluations of the behavior by the individual or in the words of Ajzen, (1991, p.188) "*the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question*". Subjective norms assess the perceived social pressures on individuals to perform or not to perform a particular behavior (Ajzen, 1991, p.188) and is therefore, internally controlled. This essentially means that it does *not* operate through external reinforcement such as the congratulations or hostility of others significant to the individual, such as friends, parents, political parties, religious organizations, etc. (Kalafatis *et al.*, 1999, p.444). It is what the individual *thinks* (subjective) that *others* who matter to him/her want him/her to do (norm). Yet, there is conflicting evidence as to whether subjective social norms are important predictors of recycling behavior in particular (Davies et al., 2002), with some focusing on the visibility of the behavior (e.g. being performed in public) as a determinant of the importance of subjective norms (for a detailed analysis of issues surrounding subjective norms see Tucker, 1999).

A schematic representation of the initial *Theory of Reasoned Action* follows in *Figure 2.3.1.*

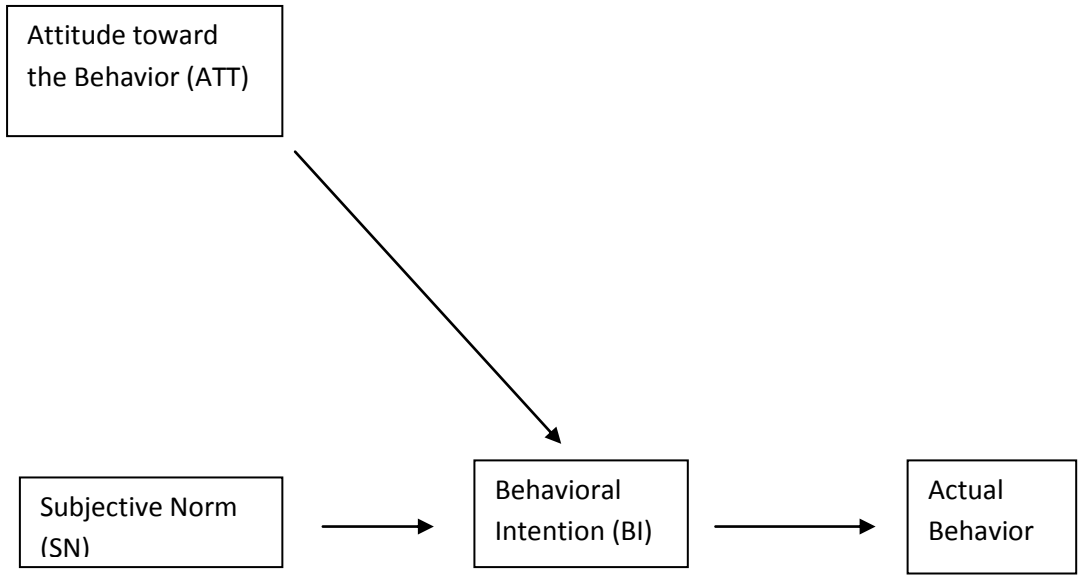


Figure 2.3.1: Schematic representation of the Theory of Reasoned Action (Ajzen, 1991)

Where motivation and opportunity permit, attitude toward a behavior may well influence behavior via intentions, but a person's behavior can be also influenced by non-volitional factors that inhibit or facilitate the behavior. This is particularly important for recycling behavior since it is self-evident that access to an established and well-structured recycling system can make a difference into recycling behavior. Many researchers have additionally empirically proved this (e.g. Boldero, 1995; see Tucker and Speirs, 2003). Indeed, a person might have a positive attitude toward recycling and also have a perception of general social pressure to engage in recycling, but situational factors such as the inconvenient location of the nearest recycling blue bin inhibit him from actually recycling. The lack of non-volitional factors is a major setback for the Theory of Reasoned Action (TRA) that has led to the questioning of its applicability (Ajzen, 1985, p.30; 1991).

The Theory of Planned Behavior (TPB) has been assumed to fill this void by introducing a third predictor of behavioral intention, the *perceived behavioral control (PBC)*, which concerns the possession of requisite resources and opportunities to perform a specific behavior, incorporating perceptions of control over performance of that behavior (Ajzen, 1991). People who perceive that they have access to the necessary resources and that there are the opportunities (or there are no obstacles) to perform the behavior, are likely to have a high degree of PBC (Ajzen, 1991**).** In simple words, PBC is the individual's perception of the extent to which performance of the behavior is easy or difficult (Ajzen, 1991, p.122). This control than an individual has on performing a behavior, can be seen as continuum according to Conner and Armitage (1998): at the one end are easily executed behaviors such as buying a beverage, while at the other end we find behaviors that demand resources, opportunities, and specialized skills (e.g. becoming a doctor).

The link between PBC and behavior is more complex than the link between behavior and intention. According to the TPB theory, PBC effects behavior both directly and indirectly through intentions. TPB depicts the actual behavior itself as a function of PBC and intentions and Ajzen (1991, p.184) offers two reasons for this:

"*First, holding intention constant, the effort expended to bring a course of behavior to a successful conclusion is likely to increase with perceived behavioral control. (…)The second reason for expecting a direct link between perceived behavioral control and behavioral achievement is that perceived behavioral control can often be used as a substitute for a measure of actual control."*

Another important element concerning intentions and PBC that should be noted is that their importance in predicting actual behavior depends upon the type of the specific behavior examined and the nature of the situation Ajzen (1991, p.185). This also applies for the relative importance of attitude, subjective norm and perceived behavioral control in the prediction of intentions.

To recap, a person's behavior can be directly predicted by one's intention to perform this behavior and his/her control over the performance of the behavior in question (the PBC). Behavioral intention moreover is influenced by attitude, subjective norm and perceived behavioral control. Hence, an individual forms a behavioral *plan* or intention about how to behave based on his/her attitude, normative pressures and perceptions of control over the behavior: it is a *planned behavior* (Conner and Armitage, 1998). TPB, therefore, as Bamberg and Moser (2007) have successfully pointed out, is based on a model of human beings with hedonistic attributes that are motivated to seek rewards and avoid punishment or negative consequences.

For a better understanding of the causal relationships and links that TPB outlines a schematic representation of the classic theory is depicted in *Figure 2.3.2*.

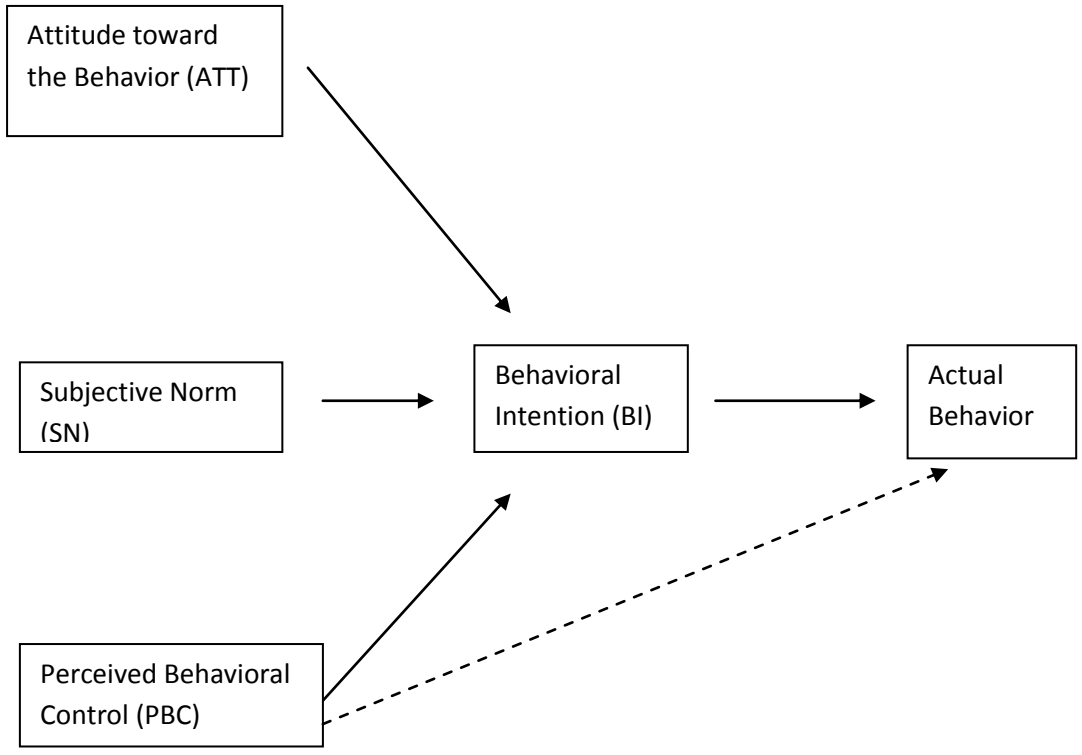


Figure 2.3.2: Schematic representation of the Theory of Planned Behavior (Ajzen, 1991)

All these factors, attitude toward the behavior (ATT), subjective norm (SN) and perception of behavioral control (PBC) influence the *behavioral intention (BI).*

Ajzen (1991) furthermore argues that "…*the more favorable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person's intention to perform the behavior in question."* In other words he identifies a positive relationship between ATT/SN/PBC and BI.

2.4 A moral extension of TPB

Many previous studies have used TPB to explain a wide range of intentions leading to specific behaviors in many domains such as social psychology, marketing, consumer behavior, leisure choice, health psychology, recycling and more, and has exhibited strong predictive power in terms of the percentage of variance explained in behavior and intentions by TPB components (Conner and Armitage, 1998; Armitage and Conner, 2001; Davies *et al*., 2002).

As Ajzen (1991) himself has pointed out, the TPB model can generally explain between 25% and 30% of the variance in behavior. Moreover, meta-analytic results support the models overall predictive utility, with 39% and 27% of the variance accounted for in intention and behavior respectively (Armitage and Conner, 2001; Bamberg and Moser, 2007).

The predictive power of TPB has been generally satisfactory also in the recycling domain (Boldero, 1995; Chan, 1998; Cheung et al., 1999; Davies *et al*., 2002; Barr *et al*., 2003; Tonglet *et al*., 2004; Knussen *et al*., 2004; Manetti et al., 2004; Davis *et al*., 2006; Knussen and Yule, 2008; Davis and Morgan, 2008; Chen and Tung, 2010; Nigbur *et al*., 2010; Bezzina and Dimech, 2011; Ioannou *et al*., 2011; Ramayah *et al*., 2012; Chan and Bishop, 2013) where TPB components were relatively good predictors of recycling intentions.

Quantitative information about the relative contribution of TPB components can be found in *Table 2.4.1*, derived from a meta-analytic review by Armitage and Conner (2001).

Relationship	N of tests	R^a	R^2	Fail-safe N	χ^2
Multiple correlation (BI + PBC) with behaviour	63	.52	.27	65,347	648***
BI–behaviour correlation	48	.47	.22	26,235	396***
PBC–behaviour correlation	60	.37	.13	27,498	677***
% variance added by PBC to behaviour	66	.14	.02	3815	285***
Multiple correlation (ATT + SN + PBC) with BI	154	.63	.39	986,974	3231***
ATT–BI correlation	115	.49	.24	326,497	1050***
SN–BI correlation	137	.34	.12	201,774	1167***
PBC–BI correlation	144	.43	.18	378,681	2224***
% variance added by PBC to BI	136	.24	.06	89,753	1086***
Behavioural belief–ATT correlation	42	.50	.25	34,201	413***
Normative belief–SN correlation	34	.50	.25	20,794	451***
Control belief–PBC correlation	18	.52	.27	6174	269***

***$p < .001$.
Note. [a]Weighted by sample size; BI = behavioural intention; PBC = perceived behavioural control; ATT = attitude; SN = subjective norm.

Table 2.4.1: Average component relationships for all tests of the TPB (Armitage and Conner, 2001)

But what about the remaining percentage of the variance in intention and behavior that remains unexplained from the classic formulation of the theory? There are many general points of critique against TPB, which also relate to explaining recycling behavior (e.g. Boldero, 1995; Cheung et al., 1999; Davies et al., 2002; Davis and Morgan, 2008). One of the main points of critique is that the aspect of morality or moral motivations behind a pro-environmental behavior, such as recycling, is underrepresented in the classic model (Tonglet et al., 2004; Klockner, 2013; Chan and Bishop, 2013). TPB being a model based on rational choices does not do justice of the moral aspect of a behavior. The construct of moral norm, that captures this essence, is an individual's perceived belief about the moral correctness or incorrectness of performing a specific behavior (Ajzen, 1991; Tonglet *et al*., 2004) reflecting an additional form of normative pressure (Conner and Armitage, 1998).

Indeed, we can think of recycling as inconvenient since an individual has to sort his/her recyclable waste, store it and then dispose it in the recycling bins, while no explicit and immediate reward is offered, at least in the blue bin recycling program in Greece. Therefore, why should an individual dedicate time and effort to recycle if this question is viewed in terms of rational choice model like TPB? Recycling behavior and generally pro-environmental behavior thus can be best conceptualized as a moral behavior, since it

contains elements of personal morality as to the correctness of the behavior (Bamberg and Moser, 2007; Chen and Tung, 2010; Chan and Bishop, 2013). This essentially means that in the process of deciding whether to recycle or not, an individual's decision is influenced by not only his/her intrinsic self-interest motives (e.g. premium paid), but also by motives of a selfless or pro-social nature (e.g. protecting the environment).

Sensing this inadequacy, recent literature (e.g. Harland *et al*., 1999; Davies et al., 2002; Kaiser *et al*., 2005; Oom do Valle *et al*., 2005) explores the convergence of TPB with theories like the *Norm Activation Model*-NAM (Schwartz, 1973) and *Value-Belief Norm* theory-VBN (Stern, 1999; 2000), which propose the activation of personal or moral norms as a direct determinant of a pro-environmental behavior such as recycling. Although, NAM and VBN are "tailor made" for pro-environmental behavior, TRA and TPB boast the widest support and application. This convergence, in practice the extension of TPB in order to include aspects of moral motives, has received support by many researchers and meta-analytic reviews (Conner and Armitage, 1998; Davies et al., 2002; Tonglet *et al*., 2004; Bamberg and Moser, 2007; Chen and Tung, 2010; Bezzina and Dimech, 2011; Klockner, 2013; Chan and Bishop, 2013).

Ajzen (1991, p.199) is open to the inclusion of additional variables in principal, as long as they significantly contribute to the model. Although he generally believes that the impact of other variables is mediated by the TPB components (ATT, SN, PBC via BI), he has argued that especially moral norms may prove to be a useful addition. Klockner (2013) supporting Ajzen, claims that part of the impact of personal/moral norms is mediated by attitude *"meaning that what people consider favourable also takes into account if the respective behaviour is in line with personal values"* concluding that personal norms add to explaining variation in pro-environmental intentions.

Although the inclusion of moral norms (MN) as an additional predictor has received support there is no consensus as to how moral norms should be fitted in TPB (Chan and Bishop, 2013): can they serve as predictors of attitude (Chen & Tung, 2010), can moral norms be already represented in people's attitudes in conjunction with self-interest and rational choice considerations (Klockner, 2013), and if yes can they replace attitudes altogether (Chan and Bishop, 2013)? Kaiser (*et al*., 2005; 2006) investigated the possible fit of moral norms without arriving at a definite conclusion as to if moral norms would better serve as antecedents of attitudes or just replace them when examining pro-

environmental behavior. The proposition that moral norms precede peoples' intentions (Harland et al., 1999) is also debatable boosting the least support from the possible fits (Kaiser and Scheuthle, 2003). Moreover, the nature of the relationship between moral norms and subjective norms or perceived behavioral control is yet to be determined (Conner and Armitage, 1998).

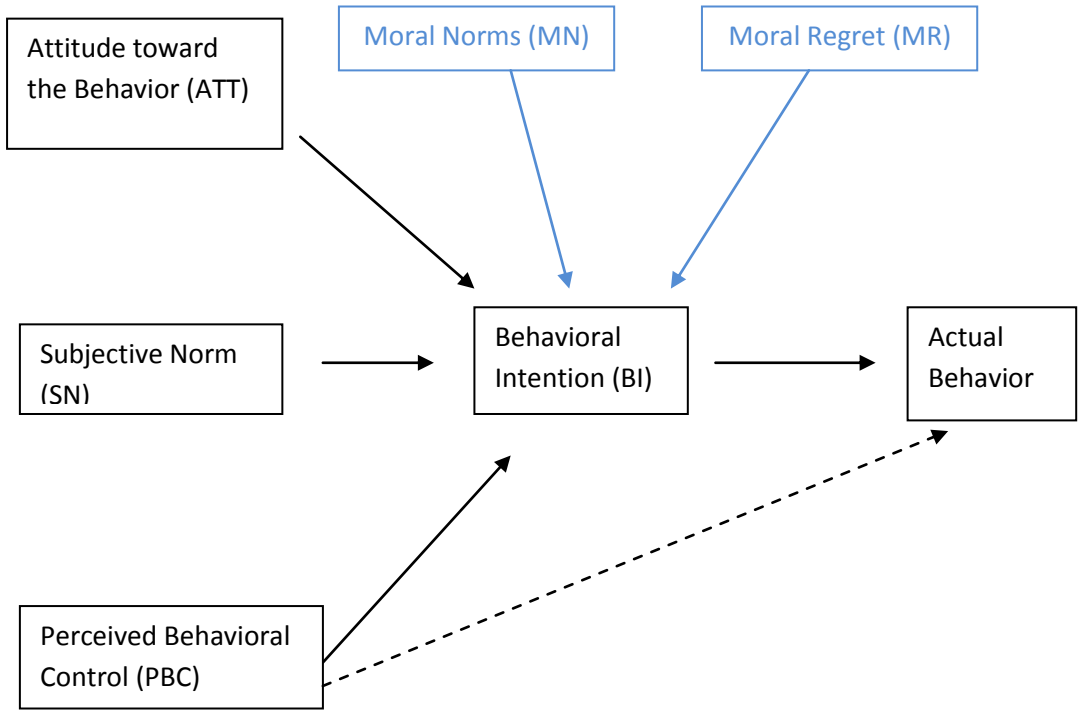


Figure 2.4.1: Moral Norms and anticipated feelings of Moral regret serve as predictors of behavioral intention in an extended Theory of Planned Behavior

Another moral related component that can possibly enhance TPB predictive utility and has yet to be successfully investigated, is the aspect of anticipated feelings of moral regret (MR) (Kaiser, 2006). In the present thesis we employed both constructs of moral norms and anticipated feelings of moral regret, as in Kaiser (2006), making the assumption that both are direct predictors of recycling intention (*Figure 2.4.1*).

3. Methodology

3.1 Questionnaire Construction

The construction of the questionnaire followed the instructions by Ajzen (2002; 1991) and used established measurement scales and indicators adopted by previous studies from Tonglet *et al*. (2004), Kaiser (2006), Davis *et al*. (2006) and Chen and Tung (2010) who employed TPB in order to investigate recycling intention. Items were adapted for the requirements of this research but the general style of the studies was followed and all measures conform to common assessment practices in this field.

TPB was tested against a sample of young Greeks using quantitative self-report scales in the questionnaire survey prepared in the Greek language. The questionnaire was constructed via the *Google docs* online platform and then was communicated online to a convenience sample through social media (Facebook) and academic email databases of the *International Hellenic University*, *University of the Aegean* and *University of Macedonia* from October 26 to November 20 2013.

In the opening instructions of the questionnaire a brief definition of recycling was provided to respondents. The respondents were asked to answer each item in a 7 point Likert-type scale, as most applications of TPB do (Ajzen, 1991, p.192), except questions concerning attitude that are scored in a semantic differential scale. This selection had the intention to ensure that scales, where possible, were both relevant and supported by previous testing. Moreover, Ajzen (1985, p.15; 1991) points out that the three determinants of intention (ATT, SN, PBC) may be measured directly or indirectly and both methods are equally recommended. In this thesis, the author chose to use the direct measurement of ATT, SN and PBC and thus employ the respective measures in the questionnaire (for a detailed review on the indirect and direct measures of TPB components see Ajzen 1985 and 1991). Moreover, the element of time was employed in order to focus respondents on the stated period of the next month (Ajzen, 2002; Harland et al., 1999).

The questionnaire used in this study was composed of seven sections measuring the TPB components and the two additional components of Moral Norms (MN) and anticipated feelings of Moral Regrets (MR). In the two last sections, an item was employed to establish the proximity of the nearest to the respondent blue recycling bin and the number of persons living in the household along with demographic information were included. In

more detail ATT was measured with 6 items, SN with 3 items, PBC with 7, MN and MR with 2 and Recycling Intention (RI) by 1.

To measure ATT a semantic differential scale was used (e.g. "In the upcoming month I find recycling my waste in the blue recycling bins: *1=not sensible, 7=sensible*) including as well the *bad-good* scale which tends to capture overall evaluation of the behavior very well, as Ajzen (2002) has stated. Moreover, at this point we have to mention the possible overlap of the scales *bad-good, not responsible-responsible* with moral norms (Chan and Bishop, 2013). Generally both in the semantic differential scale and in the Likert-type scale items are scored in a *unipolar* fashion, from 1 to 7, with higher numbers representing greater subjective probabilities (7=*highly likely*) or more favorable evaluations (7=*good*), respectively (Ajzen, 2002).

To measure SN 3 items were employed (e.g. "Most people who are important to me think that I should recycle my waste in the blue recycling bins.") with a 7-point Likert-type scale (*1=strongly disagree, 7=strongly agree*). Following Ajzen's (2002), Nigbur's et al. (2010) and Cordano's et al. (2010) suggestion, a question designed to capture *descriptive* norms was included in the set of items measuring SN: "Most people who are important to me recycle their waste in the blue recycling bins." The inclusion of descriptive norms that capture the perception of the individual that others perform the behavior in question can lead to higher variability (Ajzen, 2002).

In measuring PBC, there does not appear to be a generally preferred way, some studies use items to directly determine the control respondents feel they have over the behavior and some other measure PBC indirectly through multiplying respondents' beliefs about factors that may facilitate or impede performance with their perceived control over each of those factors (Davies et al., 2002). In this thesis PBC was directly measured with 7 items such as the traditional "Recycling my waste in the blue recycling bins is easy." and with "I have plenty of opportunities to recycle my household waste in the blue recycling bins." with a 7-point Likert-type scale (*1=strongly disagree, 7=strongly agree*). Situational and control factors were also employed along with the traditional measures, in order to provide a more accurate measure of PBC. Following Tonglet et al. (2004) there were used measures focused on factors of inconvenience, know-how, what can be recycled in the blue recycling bins, knowledge of the location of the blue recycling bins and provision of recycling resources.

MN was measured with: "*It is morally responsible…"* and "*It is my moral obligation to other people and/or the environment that I recycle my waste in the blue recycling bins.*" MR was measured with "I would feel guilty if I did not recycle my household waste." and "My conscience would bother me if I did not recycle my household waste." Both MN and MR were operationalized in a *1=strongly disagree, 7=strongly agree* scale. Lastly, BI was measured with items such as "How likely is it that you recycle your waste in the blue recycling bins over the upcoming month." (*1=highly unlikely, 7=highly likely*).

The support for TPB is considerable as it has been mentioned, though it has also received its fair share of critique. When using TPB researchers have to be aware of the issues surrounding TPB (Armitage and Conner, 2001): self-report issues, issues as to the exact nature of PBC (internal and external control factors, this thesis employs both), measures of behavioral intentions (e.g. "I intend to perform behavior x") vs measures of self-predictions (as in this thesis' questionnaire e.g. "How likely is it that you will perform behavior x?") and the relative strength of subjective norms across various behaviors. To conclude, the majority of the surveys are a single snapshot in time, they do not provide a complete picture of the behavior at a longitudinal level, a shortcoming that should also been taken into account (Tucker and Speirs, 2003).
The questionnaire is presented in Appendix 1 in Greek and in Appendix 2 in English.

3.2 Research Objectives and Hypotheses

The main objective of this study is to investigate and understand the factors that predict recycling participation by testing the applicability and appropriateness of TPB within the recycling domain. In more details the research presented here aims at determining the relative contributions of *attitudes*, *perceived behavioral control* and *subjective norm* to intentions of recycling. Moreover, this study explores the contribution to the theory and the validity of the additional parameters of *moral norm* and *anticipated feelings of moral regret*.

Next, the hypotheses of the research are stated:
(H1) Attitude (ATT) toward recycling is positively related to the behavioral intention (BI) of recycling. Individuals with positive attitude are more likely to form intentions of recycling their waste.

(H2) The Subjective Norms (SN) toward recycling are positively related to the behavioral intention (BI) of recycling. Individuals with a higher perceived social pressure to recycle are more likely to form intentions of recycling their waste.

(H3) Perceive Behavioral Control (PBC) for recycling is positively related to the behavioral intention (BI) of recycling. Individuals with a higher perceived control over recycling are more likely to form intentions of recycling their waste.

(H4) Moral Norms (MN) toward recycling are positively related to the behavioral intention (BI) of recycling. Individuals with a higher moral obligation/responsibility to other people and/or the environment are more likely to form intentions of recycling their waste.

(H5) Anticipated Feelings of Moral Regret (MR) for not recycling is positively related to the behavioral intention (BI) of recycling. Individuals with higher degree of moral regrets over not recycling are more likely to form intentions of recycling their waste.

4. Results

4.1 Sample Description

SPSS version 20 was employed in the analysis of the questionnaire responses, the compilation of the graphs and tables. The valid responses recorded from the online questionnaire were 293.

40% of the respondents were male, 60% female and 3 respondents chose not to disclose (*Pie chart 4.1.1*). Therefore, we detect a gender bias in the sample towards females.

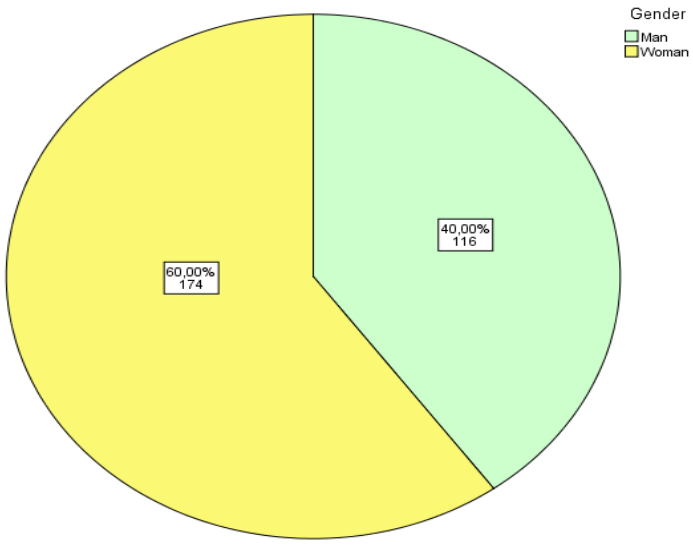


Figure 4.1.1: Gender

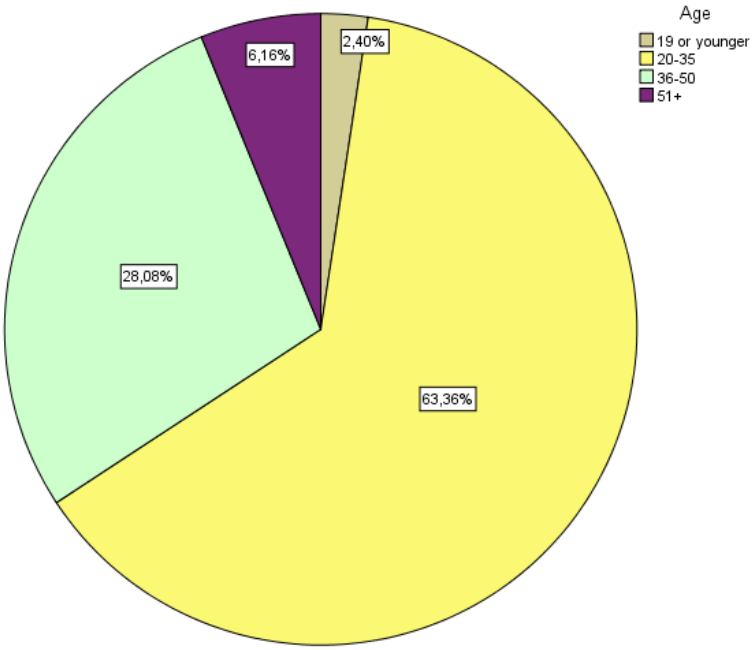


Figure 4.1.2: Age

2,4% of the respondents were 19 years old or younger, the majority of 63,36% between 20-35, 28,08% between 36-50, 6,16% 51 and older and finally 1 respondent did not answer (*Pie chart 4.1.2*). Evidently, we have a relatively young sample where 93,8% of the respondents were below the age of 50 and this will be taken into account when deriving conclusions.

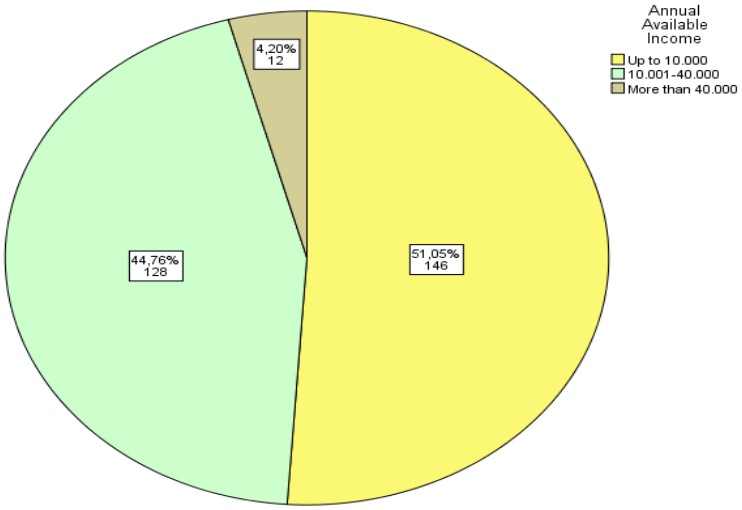


Figure 4.1.3: Available Annual Income

51,05% of the respondents stated that they had an annual available income up to 10.000€, 44,76% earned 10.001-40.000€, only 4,2% earned more than 40.000€ and 7 respondents chose not to disclose (*Pie chart 4.1.3*). Due to the relatively young age of the respondents and the severe economic crisis in Greece, this income distribution was expected.

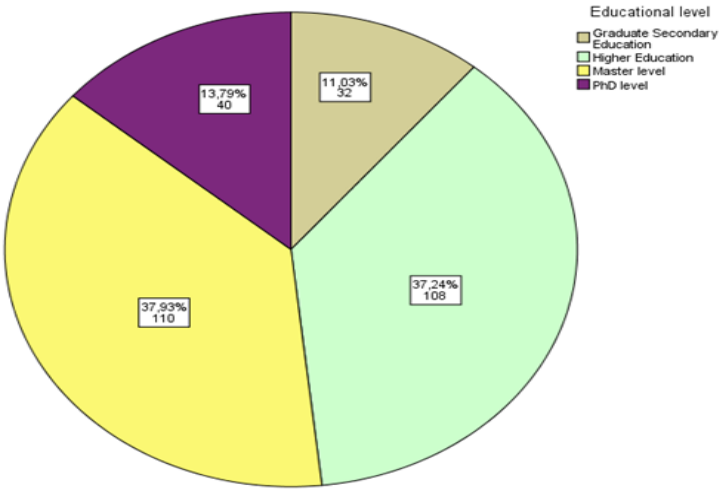


Figure 4.1.4: Educational level

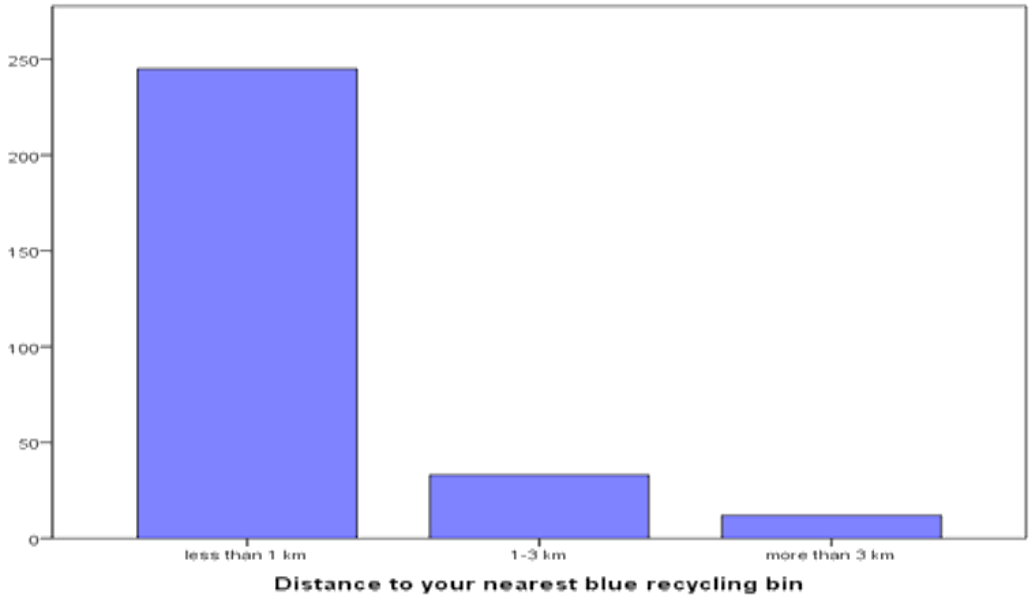
11,03% of the respondents were graduates of the secondary educational level, 37,24% stated a higher educational level (Universities or Technical Institutes), 37,93% were on a Master level, 13,79% were on PhD level and 3 respondents chose not to disclose (*Pie chart 4.1.4*). It is clear that the majority of the respondents are well educated, which may constitute an education bias.

Moreover, the majority of the respondents (33,1%) stated that their household was composed of two persons, 18,5% of three, 24,2% of four and 12 did not answer (*Appendix 3, Table 1*). Lastly, 70% of the respondents' households did not include any underage person, 9,2% stated one, 9,6% stated two and 21 did not answer (*Appendix 3, Table 2*).

4.2 Descriptive Statistics

Having explored the demographic synthesis of our sample, now we can derive useful information employing descriptive statistics. In more detail, the majority of respondents (84,5%) stated that the nearest to them blue recycling bin was under 1 km (see also *Appendix 3*, *Table 3*).

Figure 4.2.1: Distance to your nearest blue recycling bin.



Thus, the majority of respondents are in a walking distance from a blue bin, a fact that should considerably low their perceived inconvenience of actually performing the behavior in question.

Now, as for the ***attitudes*** (ATT1 – ATT6) of the respondents towards recycling their waste over the next month, the following figures (*Figure 4.2.2-4.2.7*) summarize the results (see also *Appendix 3, Tables 4-9*):

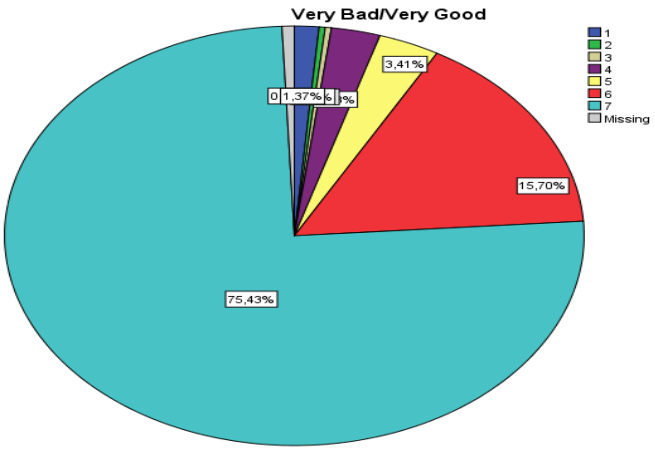


Figure 4.2.2: Recycling my waste in the blue recycling bins, over the next month is: 7=very good, 1=very bad

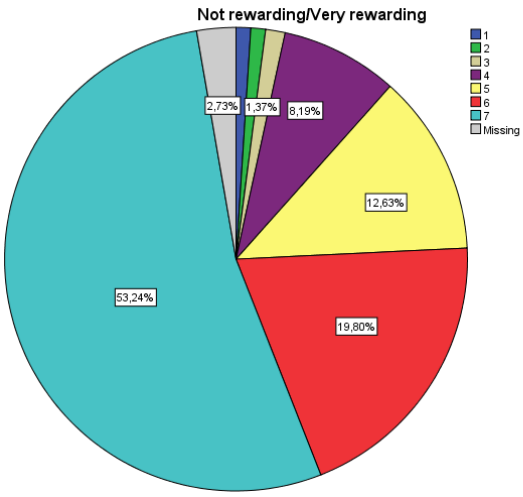


Figure 4.2.3: Recycling my waste in the blue recycling bins, over the next month is: 7=very rewarding, 1=not rewarding

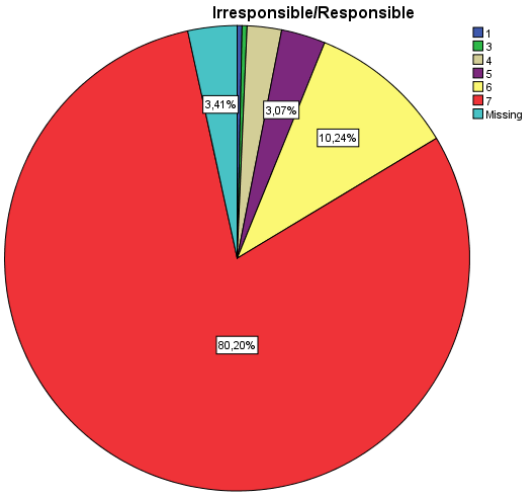


Figure 4.2.4: Recycling my waste in the blue recycling bins, over the next month is: 7=responsible, 1=irresponsible

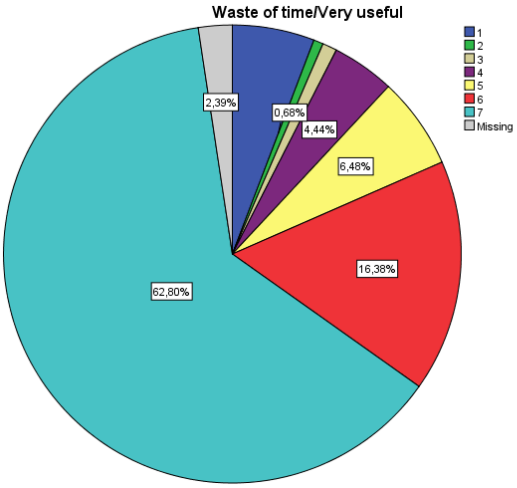


Figure 4.2.5: Recycling my waste in the blue recycling bins, over the next month is: 7=very useful, 1=waste of time

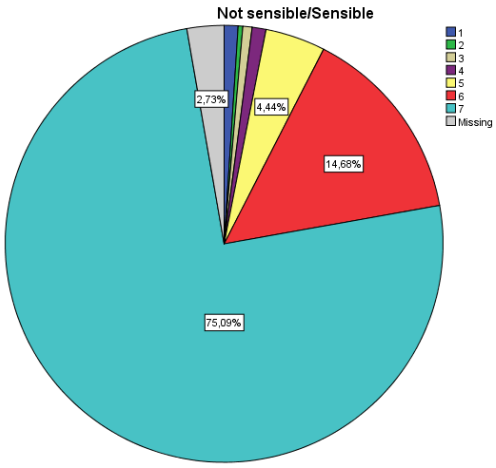


Figure 4.2.6: Recycling my waste in the blue recycling bins, over the next month is: 7=sensible, 1=not sensible

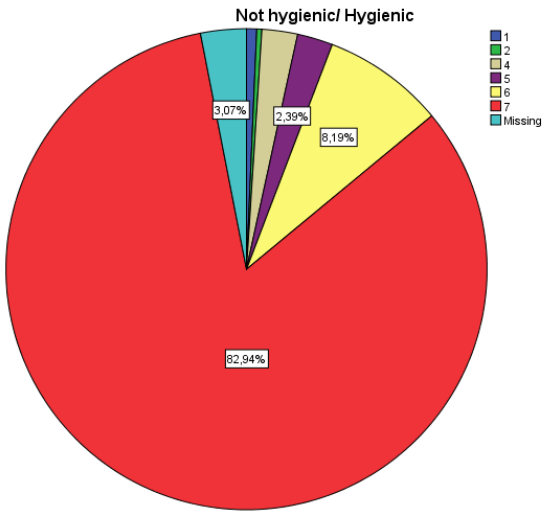


Figure 4.2.7: Recycling my waste in the blue recycling bins, over the next month is: 7=hygienic, 1=not hygienic

It becomes apparent that respondents hold strong positive attitudes towards the salient aspects (found in the literature) of recycling. ***Normative beliefs*** about perceived social pressure (SN1- SN3) are also strong since (see also *Appendix 3*, *Tables 10-12*) the majority of respondents believe that most people who are important to them think that they should recycle or would approve of them recycling.

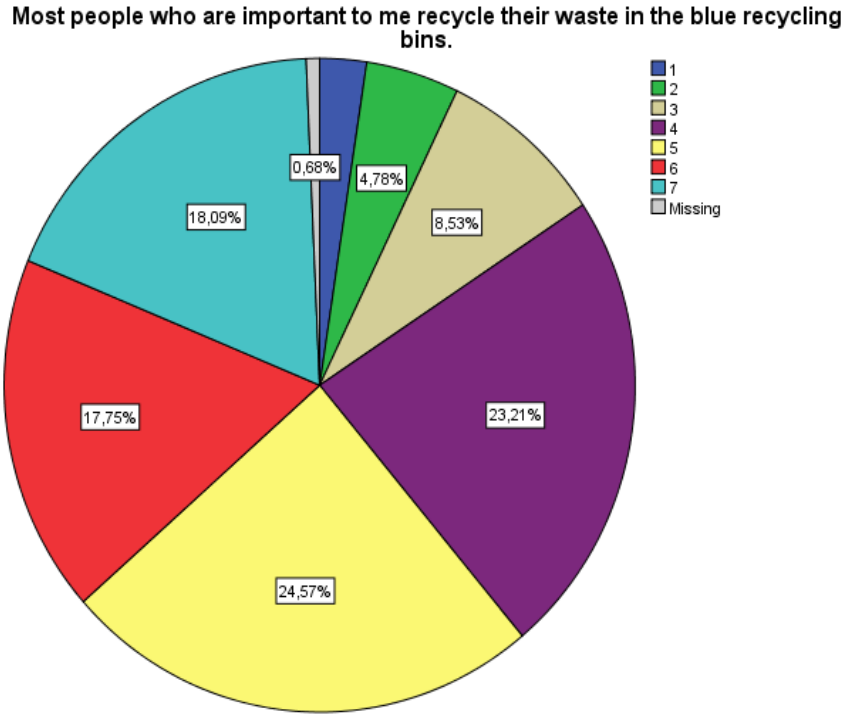


Figure 4.2.8: Most people who are important to me recycle their waste in the blue recycling bins: 7=strongly agree, 1=strongly disagree

But as to if important people recycle themselves, the level of agreement is relatively low (*Figure 4.2.8*).

Perceived control (PBC1- PBC7) over the performance of recycling is quite more complex (see *Appendix 3*, *Tables 13-19*). About half of the respondents strongly believe that they have plenty of opportunities to recycle, that recycling is convenient and easy. Around 80% claim with quite certainty that they know what items of waste can be recycled in the blue recycling bins, how they can recycle them and where those bins are.

Lastly, one item of the perceived behavioral control displayed very interesting results since the percentage of the respondent who believe that their municipality provides them with satisfactory resources in order to recycle their waste (*Figure 4.2.9*).

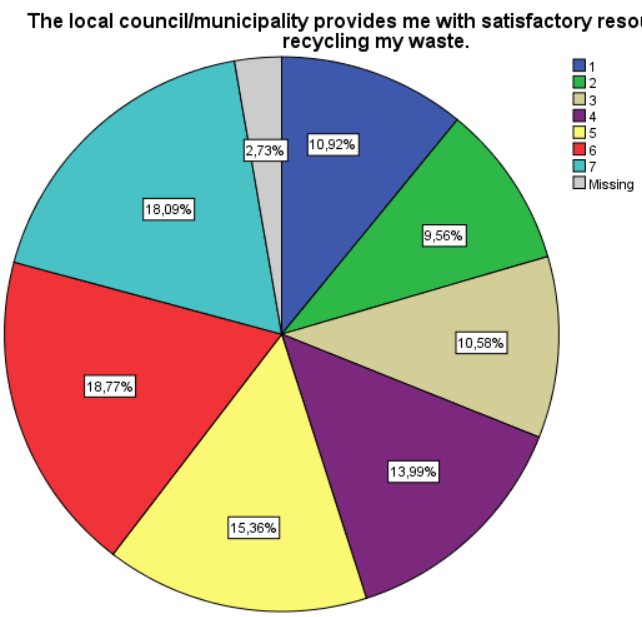


Figure 4.2.9: 7=strongly agree, 1=strongly disagree

As for ***moral norms*** (MN1 – MN2) and anticipated feelings of ***moral regret*** (MR1 – MR2), the overwhelming majority perceive recycling as their moral obligation and responsibility to other people and/or the environment. Moreover, exactly half of the respondents claim with quite certainty that they would feel guilty and that their conscience would bother them if they didn't recycle their waste (see *Appendix 3*, *Tables 20-23*). Lastly, Figure 4.2.9 summarizes the respondents' recycling intentions (see *Appendix 3*, *Table 24*).

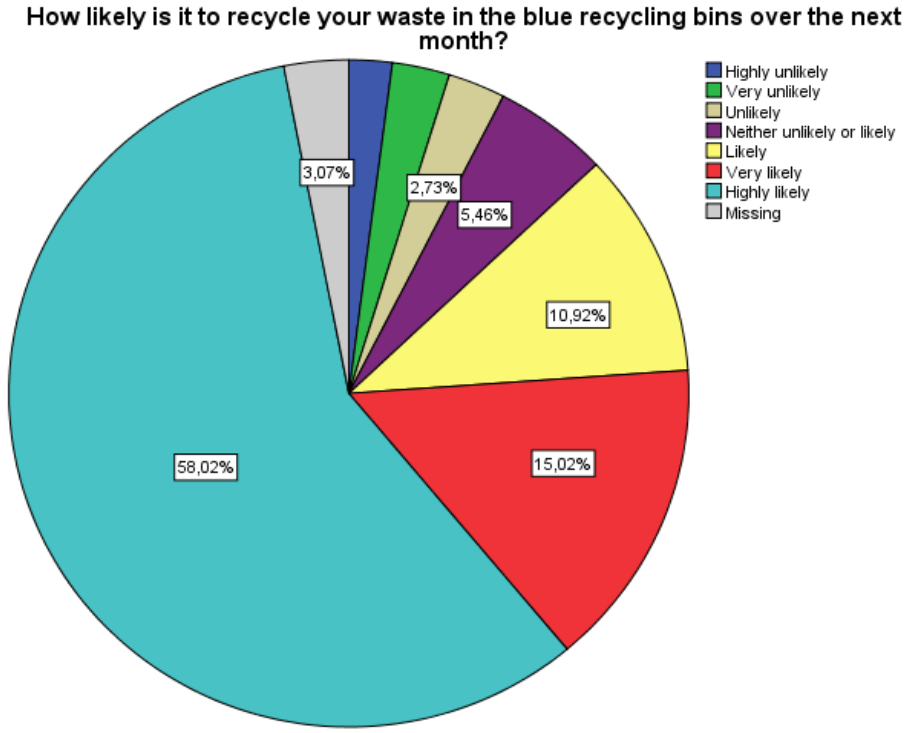


Figure 4.2.10: 7=strongly agree, 1=strongly disagree

4.3 Testing the model

4.3.1 Reliability Analysis

Before submitting the observed items to a data reduction analysis (*4.3.2 Hypotheses Testing*) it is required to test and validate the suitability of the selected items for conducting the analysis. In order to ensure the reliability and the internal consistency of the scales used, reliability analysis is performed on the items constituting each component of the Theory of Planned Behavior (ATT, SN and PBC) and the two additional parameters (MN and MR). *Table 4.3.1.1* summarizes the findings. More details about the codification of items and variables can be found in *Appendix 2*.

Variable	Cronbach's alpha
Attitude (ATT1-ATT6)	0,756
Subjective Norm (SN1-SN3)	0,767
Perceived Behavioral Control (PBC1-PBC7)	0,802
Moral Norm (MN1-MN2)	0,848
Anticipated feelings of Moral Regret (MR1-MR2)	0,947

Table 4.3.1.1: Cronbach's alpha of TPB components, moral norms and anticipated feelings of moral regret.

George and Mallery (2003, p.231) provide simple rules to check for the internal consistency of the items in the scale, using Cronbach's alpha coefficient that ranges between 0 and 1, with Cronbach's alpha > 0,7 being acceptable.

Since Cronbach's alpha reliability coefficient is greater than 0,7 in all cases, the measures have achieved acceptable reliability and internal consistency between the items attributing to each one of the five constructs, especially in the case of moral norm (MN) and anticipated feelings of moral regret (MR) factors. Generally, the results suggest that the method of factor analysis for deriving a *single factor* using the various observed items is a suitable methodology to follow. This means that each set of questions used, elicits consistent and reliable responses, thus each set represents an "underlying construct.", or in other words e.g. ATT1-ATT6 can be replaced by a global measure of attitude.

4.3.2 Hypotheses Testing

Following the reliability analysis results we submit the observed items to exploratory factor analysis to obtain a single latent construct from each set of items. Therefore, in our subsequent analysis only *composite or latent variables* of the respective 5 constructs (ATT, SN, PBC, MN and MR) will be used. These global measures of **Attitude** (ATT1-ATT6), **Subjective Norm** (SN1-SN3), **Perceived Behavioral Control** (PBC1-PBC7), **Moral Norm** (MN1-MN2) and anticipated feelings of **Moral Regret** (MR1-MR2) provide information about an individual's placement on the factors (DiStefano *et al*., 2009). To predict factor scores the least squares regression approach was used since it provides the highest correlations between a factor score and the corresponding factor (DiStefano *et al*., 2009). Moreover the factor scores were rotated using the *Varimax* method.

Subsequently, factor scores are saved for each one of the factors to perform correlation analysis between the five factors and the Recycling Intention (RI) variable. *Pearson correlation* coefficients between the RI variable and the 5 factors are presented in *Table 4.3.2.1*. As one observes, higher correlations are met between Recycling Intention and the PBC factor (*r=0.606*), the Attitude factor and Moral Norm factor (*r=0.583*) and the Moral Norm and Moral Regret factor (r=0.522). On the other hand, lowest correlations are between Attitude and Subjective Norms (*r=0.168*) and Subjective Norms with Moral Norms (*r=0.265*) and Moral Regrets (*r=0.262*).

Table 4.3.2.1 Correlations (ATT, SN, PBC, MN, MR with RI)

	RI	ATTITUDE	SUBJECTIVE NORMS	PERCEIVED BEHAVIORAL CONTROL	MORAL NORM	MORAL REGRET
RI	1					
ATTITUDE	,323(**)	1				
SUBJECTIVE NORMS	,352(**)	,168(**)	1			
PERCEIVED BEHAVIORAL CONTROL	,606(**)	,231(**)	,412(**)	1		
MORAL NORM	,380(**)	,583(**)	,265(**)	,298(**)	1	
MORAL REGRET	,424(**)	,383(**)	,262(**)	,425(**)	,522(**)	1

****. Correlation is significant at the 0.01 level (2-tailed).**

The respective results of the bivariate correlations further support the hypotheses stated by the Theory of Planned Behavior since all factors correlated positively with Recycling Intention (RI). Therefore, all five hypotheses stated are supported. Perceived behavioral control towards recycling was the factor most strongly correlated with recycling intentions, followed by the moral components (MN and MR), subjective norm and lastly attitude.

4.3.3 Hierarchical Multiple Regression Analysis

In order to test the overall predictive utility of the Theory of Planned Behavior and the influence that each component exerts on recycling intention, this thesis employs a two-step hierarchical multiple regression analysis with Recycling Intention as a dependent variable. In this way we can further explore the Recycling Intentions of respondents and their association with the various determinants as they are realized by the 5 latent constructs, and moreover determine if the explained variance of the dependent variable is increased when an additional predictor (independent variable) is added (indicated by a change in R^2).

In the first step the components of TPB (attitude, subjective norm and perceived control) were entered as independent variables (Model 1). In the second step moral norms and moral regrets were also entered (Model 2). *Table 4.3.3.1* summarizes the findings.

The components of the TPB (ATT, SN, PBC) collectively explained 41% (Adj. R^2= ,410) of the variance in the dependent variable of recycling intentions. The standardized regression coefficients for each independent variable shown in *Model 1* reveal that among the components of TPB, perceived behavioral control (b = 0,503, $p < ,05$) exerts by far the greater influence, followed by attitude (b = 0,202, $p < ,05$) and subjective norms (b =0,130, $p < ,05$). The relative contribution of each of the independent variables in explaining the variance in recycling intention is determined by the beta weight: variables whose beta weight has a Sig. $t < 0,05$ are significant at the 95% confidence level (Tonglet *et al.*, 2004). Thus, TPB components are all significant at the 95% confidence level ($p<,05$), with perceived behavioral control exerting the greater influence, followed by attitude and subjective norms.

Table 4.3.3.1: Coefficients, Hierarchical Multiple Regression Analysis						
Model - Dependent Variable: Recycling Intention		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
Model 1 Adj. R^2= ,410	(Constant)	6,099	,072		84,846	,000
	Attitude	,286	,072	,202	3,994	,000
	Subjective Norm	,190	,080	,130	2,380	,018
	Perceived Behavioral Control	,745	,082	,503	9,129	,000
Model 2 Adj. R^2= ,432	(Constant)	6,096	,071		86,298	,000
	Attitude	,135	,084	,096	1,600	,111
	Subjective Norm	,174	,078	,118	2,212	,028
	Perceived Behavioral Control	,679	,084	,458	8,072	,000
	Moral Norm	,222	,097	,147	2,287	,023
	Moral Regret	,129	,087	,088	1,480	,140

The percentage of the explained variance is quite satisfactory and in line with previous research (Armitage and Conner, 2001; Chen and Tung, 2010) and almost double (26,1%) than Tonglet's *et al.* (2004).When moral norms and anticipated feelings of moral regret were entered (*Model 2*) the percentage of variance explained increased to 43,2% (Adj. R^2=0,432) with only subjective norm, perceived behavioral control and moral norm being statistically significant at the $p<,05$ level. The greater effect is again exerted by far from perceived behavioral control, followed by moral and subjective norm. Attitude and anticipated feelings of moral regret were not significant, possibly due to their high correlation with the moral norm factor. The inclusion of the two moral constructs did not substantially improve the model's predictive utility, while anticipated feelings of moral regret were not statistically significant.

5. Conclusions and Suggestions

5.1 Recycling intention and its determinants

The objective of this study was to examine the applicability of the Theory of Planned Behavior in predicting the waste recycling behavior of residents within urban areas in Greece. The results of this study support the applicability of the Theory of Planned Behavior (TPB) in determining the antecedents of recycling intention where the recycling scheme of the blue recycling bins is available. The hypotheses of TPB, about a positive correlation between its components (attitude, subjective norm, perceived behavioral control) and recycling intention are supported. Moreover, all three constructs were found to be statistically significant predictors of recycling intention, collectively explaining a 41% of its variance, a very satisfying percentage and in line with previous studies as it was mentioned above.

The inclusion of the moral aspect of recycling behavior, as captured by moral norms and anticipated feelings of moral regret though, did not greatly improve the predictive ability of the standard model. Moreover, in the morally extended TPB model anticipated feelings of moral regret and attitude were not statistically significant. This could be possibly because the moral constructs strongly and positively correlated with the respondents' attitudes towards recycling their waste. This implies that what people think about the moral aspect of recycling their waste, is reflected in the formation of their attitudes. Consequently, an individual that perceives recycling as a behavior in line with his/her personal moral values will tend to develop more positive attitudes towards the behavior itself. The fact that moral norms were statistically significant, whereas attitude was not in the extended TPB model, leads us to believe that for behaviors such as recycling attitudes are mostly comprised by beliefs based on moral considerations and not on self-interest motivations.

The stronger effect on recycling intention was exerted by perceived behavioral control, unlike in other studies (e.g. Boldero, 1995; Davies *et al.*, 2002), which corroborated Tonglet's *et al.* (2004, p.210) position that this measure would be more appropriate for explaining the behavior of those who do not recycle or do not have access to recycling resources. PBC was a statistically significant component on both Model 1 and 2 ($p<,05$). Attitude exerted a moderate effect, being statistically significant ($p<,05$) only on Model 1.

Lastly, Subjective Norm exerted a weak effect but was statistically significant on both Models 1 and 2.

The small contribution of subjective norms in explaining recycling intention was well anticipated from previous studies (e.g. Manetti *et al.*, 2004, Knussen *et al.*, 2004; Ioannou *et al*., 2011). Nevertheless, it should be pointed out that based on the initial postulates of TPB, we would expect that the perceived social pressure would be a highly significant antecedent of recycling intentions. Subjective norm exerted the weakest effect on recycling intention on the standard and the extended model. This outcome could be explained based on Tucker's (1999) argument that in cases where the visibility of the behavior is low and the anonymity of the individual high, like recycling in a curbside drop-off scheme such as the blue recycling system in urban areas of Greece, the perceived social pressure would not exert a strong effect.

Thus, we conclude that the Theory of Planned Behavior can be successfully applied in determining the antecedents of recycling intentions as well as their relative contribution. Moreover, although the morally extended model did not substantially increase the predictive utility of TPB, it showed the importance of the inclusion of moral norms as an antecedent of recycling intentions.

5.2 Implications for policy makers

Understanding what drives individuals' recycling intentions is important in order to encourage and facilitate such a behavior. Identifying the determinants of recycling intentions can guide the development and implementation of recycling schemes and can add to the improvement of the awareness raising campaigns. Especially for a country such as Greece, where the "recycling mentality" is not widespread and the rates of material recovery are disappointingly low, knowing how to increase the participation in recycling programs is vital.

The importance of situational factors that may inhibit or facilitate recycling becomes evident from the results of the study. For residents in Greece these factors, as expressed by the composite measure of perceived behavioral control, exert the greater influence on recycling intention. In other words, the intention to recycle was significantly influenced by having the appropriate opportunities such as access to the facilities, knowledge about what, where and how to recycle. The importance of the above combined with the low percentage of respondents (36,9%) who strongly believe that their council/municipality

provides them with satisfactory resources for recycling, represents a serious challenge. Consequently, policy makers should focus on promoting and highlighting the attributes of the blue bin recycling system that best facilitate recycling: the proximity of the bins (e.g. "a blue bin near to you"), the ease of the procedure (e.g. "use it, recycle it, just as easy") and the convenience level that the above imply.

Following the findings, the overwhelming majority of respondents have a favorable predisposition toward recycling their waste. Either due to social influences or because of a sense of moral correctness, the respondents do believe that recycling is good, useful, sensible, responsible, rewarding and hygienic. Policy makers should be able to reinforce this positive attitude but more importantly "bridge" the gap between favorable attitudes and actual recycling. A key concept is, as we have already mentioned above, to provide the necessary "confidence" over the performance of the behavior. This link is crucial, since without it favorable attitudes are just empty statements lacking any practical utility.

Moreover, the strong link between attitudes and moral norms should not be neglected. The morality of recycling is an important aspect of the behavior that exerts a considerable effect on and is strongly correlated with recycling intentions. Perceiving recycling as a moral imperative could be the solution to the social problem of waste management. Appealing though to the responsible citizen rather to the self-interested private interest is not as easy as it can sound. It is up to policy makers to identify, develop and promote those personal moral values that will trigger recycling. Cultural attributes can play a vital role in this process and should be the starting point for a "moral intervention".

Another promising aspect in the moral sphere is that of anticipated feelings of moral regret. Approximately half of the respondents (50,9%) stated with quite certainty that not recycling their waste would make them feel guilty or that their conscience would bother them. This percentage is relatively low and thus awareness raising campaigns should address this issue in a subtle way. Anticipated feelings of moral regret, although proved to be not significant predictors of recycling intentions in the present study, could constitute a promising tool in order to "gauge" recycling intentions and ultimately behavior.

Recycling does not appear to be significantly influenced, on the other hand, by normative components. Indicative is the low percentage (35,8%) of people that do strongly believe that most people who are important to them recycle themselves. Compliance with the perceived normative pressures should entail and be strengthened by the subject's belief

that significant referent groups comply as well. If the perceived social pressure for one to recycle is low and in addition referent social groups do not recycle, chances are that one's intention to recycle will be weak as well. This chain of events presents a vicious circle that one event feeds the other and entry points of interventions cannot be easily identified.

5.3 Limitations and suggestions for future research

Every research endeavor has its limitations that should be both acknowledged and accounted for as factors influencing the interpretation and the utility of the results. These limitations though should not be seen only as constraints on generalizability of the findings, but should also serve as useful suggestions for future research.

A limitation of this study was the composition of the convenience sample used since, as it was demonstrated in the respective section, the majority of the respondents (93,8%) were below the age of 50 and well educated. For this reason, these findings cannot be generalized to the broader population based on this study alone. Furthermore, the focus of the study was limited to the blue recycling bins scheme only, which although is the dominant scheme it is not the only one.

Another limitation concerns the self-report nature of the study's approach. Self-reported statements should be dealt with caution since the level of accuracy and precision is debatable. A strong bias could be detected also, when examining issues strongly related to moral concepts, towards stating what one would *want to do* instead of what he or she truly *intends* to do. It is important to distinct once again between the actual behavior and the intentions, since this survey was based entirely on responses from a self-administrated questionnaire, concerning *only* the determinants of recycling intention and did not include measures of the *actual behavior*, self-reported or observed. It should be noted that the intention-behavior relationship was not examined since it exceeded this study's research boundaries.

Additionally, this survey did not differentiate between recyclable materials though the Theory of Planned Behavior has been said to be more applicable to predicting recycling of one product type (e.g. paper) (Boldero, 1995, p.443). Lastly, another limitation of the study could also be the possibility of over-representation in the sample of people more interested or more positive towards recycling since they would be the ones more motivated to participate in the online questionnaire.

The limitations of any research do not represent only its boundaries, but also the endless possibilities for future research. Below, future research suggestions are provided in the light of this study's limitations and in an effort to highlight possible future research avenues.

As it has been mentioned in a previous section, recycling is a behavior with a repetitive character affected by habits and inertia. The habitual aspect of recycling has not yet received much attention in the relevant literature (e.g. Knussen and Yule, 2008), and although it was also not incorporated as a research objective of this thesis, the author believes that it is a very interesting and promising aspect. Therefore, future studies should explore the role and relative contribution of past behavior and habit.

Further examination of the moral aspect of recycling behavior and more importantly its relationship with TPB components, could shed light as to its fit within the TPB model. Moreover, the inclusion of measures of self-reported or observed actual behavior would be important in order to assess the strength of the intention-behavior link.

Lastly, another prominent issue, that this thesis did not focus on but nevertheless is worth exploring, is the concept of self-identity, or in other words what individuals think themselves to be, can have an impact on what they do (Manetti *et al*., 2004). A self-expressive behavior approach like this implies that people tend to behave in a way that reflects their perception of who they are or who they want to be. If an individual perceives himself/herself as a recycler for x reasons, then he/she will tend to recycle.

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Appendices

Appendix 1

Ανακύκλωση απορριμμάτων στους ειδικούς μπλε κάδους.

Το ερωτηματολόγιο αυτό δημιουργήθηκε στα πλαίσια έρευνας για την εκπόνηση διπλωματικής εργασίας με σκοπό την απόκτηση μεταπτυχιακού διπλώματος εξειδίκευσης στην Βιώσιμη Ανάπτυξη (Sustainable Development) από το Διεθνές Πανεπιστήμιο Ελλάδος. Σκοπός του ερωτηματολογίου είναι να διερευνήσει την στάση των καταναλωτών απέναντι στην ανακύκλωση απορριμμάτων.

Σύντομος ορισμός: «***Ανακύκλωση*** *με καθαρά τεχνικούς όρους είναι η διαδικασία μέσα από την οποία επιτυγχάνεται η εκ νέου χρήση των υλικών συσκευασίας (γυαλί, χαρτί, πλαστικό αλουμίνιο, λευκοσίδηρο και ξύλο) και η επαναεισαγωγή τους στον κύκλο παραγωγής. Η ανακύκλωση γίνεται μέσα από τους ειδικούς* ***μπλε κάδους*** *από όπου προέρχεται σχεδόν το σύνολο της ανακύκλωσης της χώρας μας και αφορά το πιο σημαντικό και δύσκολο τμήμα των αποβλήτων: τα δημοτικά απορρίμματα. Οι ποσότητες που συλλέγονται μεταφέρονται στα Κέντρα Διαλογής Ανακυκλώσιμων Υλικών (ΚΔΑΥ), όπου τα ανακυκλώσιμα υλικά διαχωρίζονται και προωθούνται προς ανακύκλωση.*»

(Ελληνική Εταιρεία Αξιοποίησης Ανακύκλωσης, Ε.Ε.Α.Α.)

Οι απαντήσεις σας είναι ιδιαίτερα σημαντικές για την έρευνά μας και θα μας βοηθήσουν να κατανοήσουμε πώς στάσεις, αντιλήψεις και χαρακτηριστικά των ανθρώπων επηρεάζουν την απόφαση για την ανακύκλωση ή όχι των απορριμμάτων. Η συμμετοχή στην έρευνα αυτή είναι καθαρά εθελοντική και ανώνυμη. Σας ευχαριστούμε πολύ για την συμμετοχή σας!

Οι ερωτήσεις του ερωτηματολογίου απαντώνται σε 7-βάθμιες κλίμακες. Τα άκρα κάθε κλίμακας, δηλαδή το 1 και το 7, εκφράζουν δύο αντίθετες έννοιες. Όσο πιο κοντά σε κάθε μία από αυτές τις έννοιες είναι η άποψη σας, τόσο η απάντηση σας θα πλησιάζει το αντίστοιχο άκρο. Παρακαλούμε βάλτε σε κύκλο τον αριθμό που αντιπροσωπεύει την απάντησή σας.

Α) Θεωρώ ότι για τον *επόμενο μήνα* το να ανακυκλώνω τα απορρίμματά μου στους ειδικούς μπλε κάδους είναι: (ATT)

Πολύ Κακό			**Ούτε κακό, ούτε καλό**			***Πολύ Καλό***
1	2	3	4	5	6	7
Χάσιμο χρόνου			**Ούτε χάσιμο χρόνου, ούτε χρήσιμο**			***Πολύ Χρήσιμο***
1	2	3	4	5	6	7
Καθόλου Ικανοποιητικό			**Ούτε το ένα, ούτε το άλλο**			***Πολύ Ικανοποιητικό***
1	2	3	4	5	6	7
Ανεύθυνο			**Ούτε ανεύθυνο, ούτε υπεύθυνο**			**Υπεύθυνο**
1	2	3	4	5	6	7
Παράλογο			**Ούτε παράλογο, ούτε λογικό**			**Λογικό**
1	2	3	4	5	6	7
Ανθυγιεινό			**Ούτε ανθυγιεινό, ούτε υγιεινό**			**Υγιεινό**
1	2	3	4	5	6	7

Β) Σε ποιο βαθμό συμφωνείτε ή διαφωνείτε με τις παρακάτω προτάσεις; (SN)	***Διαφωνώ Απόλυτα***			**Ούτε διαφωνώ, ούτε συμφωνώ**			***Συμφωνώ Απόλυτα***
Οι περισσότεροι άνθρωποι που είναι σημαντικοί για μένα πιστεύουν ότι πρέπει να ανακυκλώνω τα απορρίμματά μου στους	1	2	3	4	5	6	7
Οι περισσότεροι άνθρωποι που είναι σημαντικοί για μένα θα ενέκριναν το να ανακυκλώνω τα απορρίμματά μου στους	1	2	3	4	5	6	7
Οι περισσότεροι άνθρωποι που είναι σημαντικοί για μένα ανακυκλώνουν τα απορρίμματά τους στους ειδικούς μπλε	1	2	3	4	5	6	7

Γ) Αν σκεφτείτε την ανακύκλωση των απορριμμάτων σας στους ειδικούς μπλε κάδους για τον επόμενο μήνα, σε ποιο βαθμό συμφωνείτε ή διαφωνείτε με τις παρακάτω προτάσεις; (PBC)	***Διαφωνώ Απόλυτα***			**Ούτε διαφωνώ, ούτε συμφωνώ**			***Συμφωνώ Απόλυτα***
Έχω πολλές ευκαιρίες να ανακυκλώσω τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7
Το να ανακυκλώσω τα απορρίμματά μου στους μπλε κάδους είναι άβολο. (R)	1	2	3	4	5	6	7
Το να ανακυκλώσω τα απορρίμματά μου στους μπλε κάδους είναι εύκολο.	1	2	3	4	5	6	7
Ο δήμος μου παρέχει ικανοποιητικές διευκολύνσεις για να ανακυκλώσω τα απορρίμματά μου.	1	2	3	4	5	6	7
Γνωρίζω ποια απορρίμματά μου ανακυκλώνονται στους ειδικούς μπλε κάδους.	1	2	3	4	5	6	7
Γνωρίζω που βρίσκεται ο μπλε κάδος για να ανακυκλώσω τα απορρίμματά μου.	1	2	3	4	5	6	7

Γνωρίζω πως μπορώ να ανακυκλώσω τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7

Δ) Σε ποιο βαθμό συμφωνείτε ή διαφωνείτε με τις παρακάτω προτάσεις;(MN and MR)	***Διαφωνώ Απόλυτα***			**Ούτε διαφωνώ, ούτε συμφωνώ**			***Συμφωνώ Απόλυτα***
Είναι ηθικά υπεύθυνο απέναντι στο περιβάλλον ή/και στους συνανθρώπους μου το να ανακυκλώνω τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7
Είναι ηθική μου υποχρέωση απέναντι στο περιβάλλον ή/και στους συνανθρώπους μου το να ανακυκλώνω τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7
Θα αισθανόμουν τύψεις αν δεν ανακύκλωνα τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7
Η συνείδησή μου θα με ενοχλούσε αν δεν ανακύκλωνα τα απορρίμματά μου στους μπλε κάδους.	1	2	3	4	5	6	7

Ε) Πόσο πιθανό είναι να ανακυκλώσετε τα απορρίμματά σας στους μπλε κάδους στον επόμενο μήνα;(RI)

Καθόλου πιθανό	***Ελάχιστα***	***Λίγο***	***Ούτε πιθανό, ούτε απίθανο***	***Αρκετά***	***Πολύ***	***Πάρα Πολύ***
1	2	3	4	5	6	7

ΣΤ) Παρακαλώ επιλέξτε σε τι απόσταση βρίσκεται ο πλησιέστερος σε εσάς ειδικός μπλε κάδος.

λιγότερο από χιλιόμετρο ☐

1-3 χιλιόμετρα ☐

παραπάνω από 3 χιλιόμετρα ☐

Ζ)Τώρα θα θέλαμε να σας ρωτήσουμε μερικά πράγματα για εσάς.

1) Φύλο: Άνδρας ☐ Γυναίκα ☐

2) Ηλικία: 19 και κάτω ☐ 20-35 ☐ 36-50 ☐ 51+ ☐

3) Ετήσιο Διαθέσιμο Εισόδημα: Μέχρι και 10.000€ ☐

10.001-40.000€ ☐

Πάνω από 40.000€ ☐

4) Μορφωτικό επίπεδο:

Απόφοιτος Λυκείου ☐

ΑΕΙ/ΤΕΙ ☐

Μεταπτυχιακές σπουδές ☐

Διδακτορικές σπουδές ☐

5) Αριθμός ατόμων που μένουν στο σπίτι: ☐

Αριθμός ανήλικων παιδιών που μένουν στο σπίτι: ☐

Σας ευχαριστούμε πολύ για την συμμετοχή σας!

Appendix 2

Attitude (ATT) (semantic scale, 1-7)

I believe that for the next month recycling my waste in the blue recycling bins is:

1. bad/good (ATT1) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

2. a waste of time/useful (ATT2) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

3. not rewarding/rewarding (ATT3) (Tonglet *et al*., 2004) (Chan and Bishop, 2013) (Davis *et al*., 2006) (Chen and Tung, 2010)

4. not responsible/responsible (ATT4) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

5. not sensible/sensible (ATT5) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

6. not hygienic/hygienic (ATT6) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

Subjective Norm (SN) (strongly disagree/agree, 1-7)

1. Most people who are important to me think that I should recycle my waste in the blue recycling bins. (SN1) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

2. Most people who are important to me would approve of me recycling my waste in the blue recycling bins. (SN2) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

3. Most people who are important to me recycle their waste in the blue recycling bins. (SN3) (Ajzen, 2002)

Perceived Behavioral Control (PBC) (strongly disagree/agree, 1-7)

If you think about recycling your waste in the blue recycling bins over the next month, what is your level of agreement or disagreement with the following statements?

1. I have plenty of opportunities to recycle my waste in the blue recycling bins. (PBC1) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

2. Recycling my waste in the blue recycling bins is inconvenient (R). (PBC2) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

3. Recycling my waste in the blue recycling bins is easy. (PBC3) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

4. The local council/municipality provides me with satisfactory resources for recycling my waste. (PBC4) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

5. I know what items of waste can be recycled in the blue recycling bins. (PBC5) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

6. I know where the blue recycling bin is in order to take my waste for recycling. (PBC6) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

7. I know how to recycle my waste in the blue recycling bins. (PBC7) (Tonglet *et al*., 2004; Chan and Bishop, 2013; Davis *et al*., 2006; Chen and Tung, 2010)

Moral Norm (MN) (strongly disagree/agree, 1-7)

1. It is morally responsible to other people and/or the environment that I recycle my waste in the blue recycling bins. (MN1) (Kaiser, 2006)

2. It is my moral obligation to other people and/or the environment that I recycle my waste in the blue recycling bins. (MN2) (Kaiser, 2006)

Anticipated feelings of moral regret (MR) (strongly disagree/agree, 1-7)

1. I would feel guilty if I did not recycle my waste in the blue recycling bins. (MR1) (Kaiser, 2006)

2. My conscience would bother me if I did not recycle my waste in the blue recycling bins. (MR2) (Kaiser, 2006)

Recycling Intention (RI) (highly unlikely/highly likely, 1-7)

How likely is it to recycle your waste in the blue recycling bins over the next month? (RI) (Tonglet *et al*., 2004)

Please indicate the distance to your nearest blue recycling bin.

Less than 1 km: ☐

1-3 km: ☐

More than 3 km: ☐

Demographics

1. Gender: Man Woman
2. Age: 19 or younger 20-35 36-50 51+
3. Annual Available Income: Up to 10.000€
   10.001-40.000€
   More than 40.000€
4. Educational level: Graduate of Secondary education
   Higher Education
   Master Level
   PhD Level
5. Number of persons living in the house:
6. Number of underage persons living in the house:

Appendix 3

Table 1: Number of persons living in the house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	47	16,0	16,7	16,7
	2	93	31,7	33,1	49,8
	3	52	17,7	18,5	68,3
	4	68	23,2	24,2	92,5
	5	17	5,8	6,0	98,6
	6	2	,7	,7	99,3
	7	1	,3	,4	99,6
	23	1	,3	,4	100,0
	Total	281	95,9	100,0	
Missing	No Answer	12	4,1		
Total		293	100,0		

Table 2: Number of underage persons living in the house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	205	70,0	75,4	75,4
	1	27	9,2	9,9	85,3
	2	28	9,6	10,3	95,6
	3	11	3,8	4,0	99,6
	12	1	,3	,4	100,0
	Total	272	92,8	100,0	
Missing	No Answer	21	7,2		
Total		293	100,0		

Table 3: Distance to your nearest blue recycling bin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 1 km	245	83,6	84,5	84,5
	1-3 km	33	11,3	11,4	95,9
	more than 3 km	12	4,1	4,1	100,0
	Total	290	99,0	100,0	
Missing	No Answer	3	1,0		
Total		293	100,0		

Table 4: Very Bad/Very Good (ATT1)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	4	1,4	1,4	1,4
	2	1	,3	,3	1,7
	3	1	,3	,3	2,1
	4	8	2,7	2,7	4,8
	5	10	3,4	3,4	8,2
	6	46	15,7	15,8	24,1
	7	221	75,4	75,9	100,0
	Total	291	99,3	100,0	
Missing	No Answer	2	,7		
Total		293	100,0		

Table 5: Waste of time/Very useful (ATT2)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	17	5,8	5,9	5,9
	2	2	,7	,7	6,6
	3	3	1,0	1,0	7,7
	4	13	4,4	4,5	12,2
	5	19	6,5	6,6	18,9
	6	48	16,4	16,8	35,7
	7	184	62,8	64,3	100,0
	Total	286	97,6	100,0	
Missing	No Answer	7	2,4		
Total		293	100,0		

Table 6: Not rewarding/Very rewarding (ATT3)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	3	1,0	1,1	1,1
	2	3	1,0	1,1	2,1
	3	4	1,4	1,4	3,5
	4	24	8,2	8,4	11,9
	5	37	12,6	13,0	24,9
	6	58	19,8	20,4	45,3
	7	156	53,2	54,7	100,0
	Total	285	97,3	100,0	
Missing	No Answer	8	2,7		
Total		293	100,0		

Table 7: Irresponsible/Responsible (ATT4)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	1	,3	,4	,4
	3	1	,3	,4	,7
	4	7	2,4	2,5	3,2
	5	9	3,1	3,2	6,4
	6	30	10,2	10,6	17,0
	7	235	80,2	83,0	100,0
	Total	283	96,6	100,0	
Missing	No Answer	10	3,4		
Total		293	100,0		

Table 8: Not sensible/Sensible (ATT5)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	3	1,0	1,1	1,1
	2	1	,3	,4	1,4
	3	2	,7	,7	2,1
	4	3	1,0	1,1	3,2
	5	13	4,4	4,6	7,7
	6	43	14,7	15,1	22,8
	7	220	75,1	77,2	100,0
	Total	285	97,3	100,0	
Missing	No Answer	8	2,7		
Total		293	100,0		

Table 9: Not hygienic/ Hygienic (ATT6)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	2	,7	,7	,7
	2	1	,3	,4	1,1
	4	7	2,4	2,5	3,5
	5	7	2,4	2,5	6,0
	6	24	8,2	8,5	14,4
	7	243	82,9	85,6	100,0
	Total	284	96,9	100,0	
Missing	No Answer	9	3,1		
Total		293	100,0		

Table 10: Most people who are important to me think that I should recycle my waste in the blue recycling bins. (SN1)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	2	,7	,7	,7
	2	4	1,4	1,4	2,1
	3	17	5,8	5,9	7,9
	4	49	16,7	16,9	24,8
	5	60	20,5	20,7	45,5
	6	67	22,9	23,1	68,6
	7	91	31,1	31,4	100,0
	Total	290	99,0	100,0	
Missing	No Answer	3	1,0		
Total		293	100,0		

Table 11: Most people who are important to me would approve of me recycling my waste in the blue recycling bins. (SN2)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	1	,3	,3	,3
	2	1	,3	,3	,7
	3	6	2,0	2,1	2,7
	4	23	7,8	7,9	10,7
	5	39	13,3	13,4	24,1
	6	76	25,9	26,1	50,2
	7	145	49,5	49,8	100,0
	Total	291	99,3	100,0	
Missing	No Answer	2	,7		
Total		293	100,0		

Table 12: Most people who are important to me recycle their waste in the blue recycling bins. (SN3)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	7	2.4	2.4	2.4
	2	14	4.8	4.8	7.2
	3	25	8.5	8.6	15.8
	4	68	23.2	23.4	39.2
	5	72	24.6	24.7	63.9
	6	52	17.7	17.9	81.8
	7	53	18.1	18.2	100.0
	Total	291	99.3	100.0	
Missing	No Answer	2	.7		
Total		293	100.0		

Table 13: I have plenty of opportunities to recycle my waste in the blue recycling bins. (PBC1)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	11	3,8	3,8	3,8
	2	11	3,8	3,8	7,5
	3	23	7,8	7,9	15,4
	4	27	9,2	9,2	24,7
	5	57	19,5	19,5	44,2
	6	75	25,6	25,7	69,9
	7	88	30,0	30,1	100,0
	Total	292	99,7	100,0	
Missing	No answer	1	,3		
Total		293	100,0		

Table 14: Recycling my waste in the blue recycling bins is convenient. (PBC2)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	19	6,5	6,6	6,6
	2	29	9,9	10,1	16,8
	3	35	11,9	12,2	29,0
	4	25	8,5	8,7	37,8
	5	28	9,6	9,8	47,6
	6	68	23,2	23,8	71,3
	7	82	28,0	28,7	100,0
	Total	286	97,6	100,0	
Missing	No Answer	7	2,4		
Total		293	100,0		

Table 15: Recycling my waste in the blue recycling bins is easy. (PBC3)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	10	3,4	3,5	3,5
	2	18	6,1	6,2	9,7
	3	21	7,2	7,3	17,0
	4	31	10,6	10,7	27,7
	5	39	13,3	13,5	41,2
	6	71	24,2	24,6	65,7
	7	99	33,8	34,3	100,0
	Total	289	98,6	100,0	
Missing	No Answer	4	1,4		
Total		293	100,0		

Table 16: The local council/municipality provides me with satisfactory resources for recycling my waste. (PBC4)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	32	10,9	11,2	11,2
	2	28	9,6	9,8	21,1
	3	31	10,6	10,9	31,9
	4	41	14,0	14,4	46,3
	5	45	15,4	15,8	62,1
	6	55	18,8	19,3	81,4
	7	53	18,1	18,6	100,0
	Total	285	97,3	100,0	
Missing	No Answer	8	2,7		
Total		293	100,0		

Table 17: I know what items of waste can be recycled in the blue recycling bins. (PBC5)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	2	,7	,7	,7
	2	4	1,4	1,4	2,1
	3	7	2,4	2,5	4,6
	4	8	2,7	2,8	7,4
	5	40	13,7	14,0	21,4
	6	82	28,0	28,8	50,2
	7	142	48,5	49,8	100,0
	Total	285	97,3	100,0	
Missing	No Answer	8	2,7		
Total		293	100,0		

Table 18: I know where the blue recycling bin is in order to take my waste for recycling. (PBC6)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	13	4,4	4,5	4,5
	2	8	2,7	2,8	7,3
	3	6	2,0	2,1	9,4
	4	8	2,7	2,8	12,2
	5	23	7,8	8,0	20,1
	6	48	16,4	16,7	36,8
	7	182	62,1	63,2	100,0
	Total	288	98,3	100,0	
Missing	No Answer	5	1,7		
Total		293	100,0		

Table 19: I know how to recycle my waste in the blue recycling bins. (PBC7)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	5	1,7	1,7	1,7
	2	4	1,4	1,4	3,1
	3	3	1,0	1,0	4,1
	4	12	4,1	4,1	8,2
	5	39	13,3	13,4	21,6
	6	69	23,5	23,6	45,2
	7	160	54,6	54,8	100,0
	Total	292	99,7	100,0	
Missing	No Answer	1	,3		

Total	293	100,0		

Table 20: It is morally responsible to other people and/or the environment that I recycle my waste in the blue recycling bins. (MN1)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	1	,3	,3	,3
	2	1	,3	,3	,7
	3	2	,7	,7	1,4
	4	5	1,7	1,7	3,1
	5	9	3,1	3,1	6,2
	6	48	16,4	16,6	22,8
	7	224	76,5	77,2	100,0
	Total	290	99,0	100,0	
Missing	No Answer	3	1,0		
Total		293	100,0		

Table 21: It is my moral obligation to other people and/or the environment that I recycle my waste in the blue recycling bins. (MN2)

		Frequency	Percent	Valid Percent	Cumulative
Valid	1	1	,3	,3	,3
	2	2	,7	,7	1,0
	3	1	,3	,3	1,4
	4	8	2,7	2,8	4,2
	5	21	7,2	7,3	11,4
	6	50	17,1	17,3	28,7
	7	206	70,3	71,3	100,0
	Total	289	98,6	100,0	
Missing	No Answer	4	1,4		
Total		293	100,0		

Table 22: I would feel guilty if I did not recycle my waste in the blue recycling bins. (MR1)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	5,1	5,2	5,2
	2	15	5,1	5,2	10,4
	3	21	7,2	7,3	17,6
	4	37	12,6	12,8	30,4
	5	52	17,7	18,0	48,4
	6	50	17,1	17,3	65,7
	7	99	33,8	34,3	100,0
	Total	289	98,6	100,0	
Missing	No Answer	4	1,4		
Total		293	100,0		

Table 23: My conscience would bother me if I did not recycle my waste in the blue recycling bins. (MR2)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	11	3,8	3,8	3,8
	2	19	6,5	6,5	10,3
	3	15	5,1	5,2	15,5
	4	41	14,0	14,1	29,6
	5	56	19,1	19,2	48,8
	6	58	19,8	19,9	68,7
	7	91	31,1	31,3	100,0
	Total	291	99,3	100,0	
Missing	No Answer	2	,7		
Total		293	100,0		

Table 24: How likely is it to recycle your waste in the blue recycling bins over the next month? (RI)					
		Frequency	Percent	Valid Percent	Cumulative
Valid	Highly unlikely	6	2,0	2,1	2,1
	Very unlikely	8	2,7	2,8	4,9
	Unlikely	8	2,7	2,8	7,7
	Neither unlikely or likely	16	5,5	5,6	13,4
	Likely	32	10,9	11,3	24,6
	Very likely	44	15,0	15,5	40,1
	Highly likely	170	58,0	59,9	100,0
	Total	284	96,9	100,0	
Missing	No Answer	9	3,1		
Total		293	100,0		

Table 25: Total Variance Explained (Extraction Method: Principal Component Analysis)						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of	Cumulative %	Total	% of	Cumulative %
1	5,904	29,522	29,522	5,904	29,522	29,522
2	2,723	13,617	43,140	2,723	13,617	43,140
3	1,548	7,740	50,880	1,548	7,740	50,880
4	1,396	6,979	57,859	1,396	6,979	57,859
5	1,242	6,212	64,071	1,242	6,212	64,071
6	,904	4,519	68,590			
7	,835	4,177	72,767			
8	,763	3,815	76,583			
9	,699	3,495	80,078			
10	,564	2,818	82,896			
11	,516	2,582	85,477			
12	,499	2,495	87,972			

13	,433	2,163	90,135			
14	,409	2,043	92,178			
15	,379	1,896	94,075			
16	,315	1,574	95,648			
17	,308	1,538	97,187			
18	,253	1,266	98,453			
19	,220	1,098	99,551			
20	,090	,449	100,000			